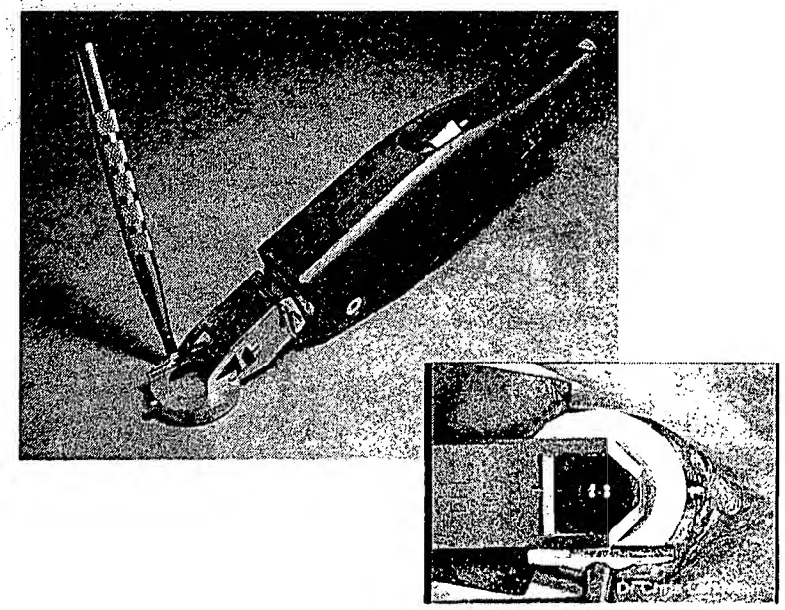
BEST AVAILABLE COPY

EPI-LASIK

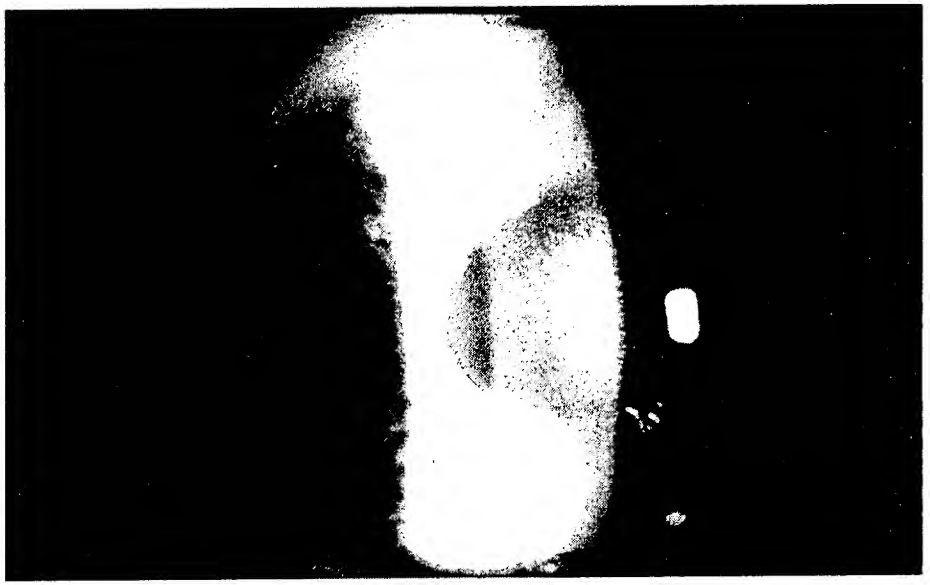
Epi-Tome®

Gebauer

Chris P Lohmann, MD, PhD
Professor of Ophthalmology
University Eye Clinic
Regensburg, Germany



QuickTime™ and a
Photo - JPEG decompressor
are needed to see this picture.

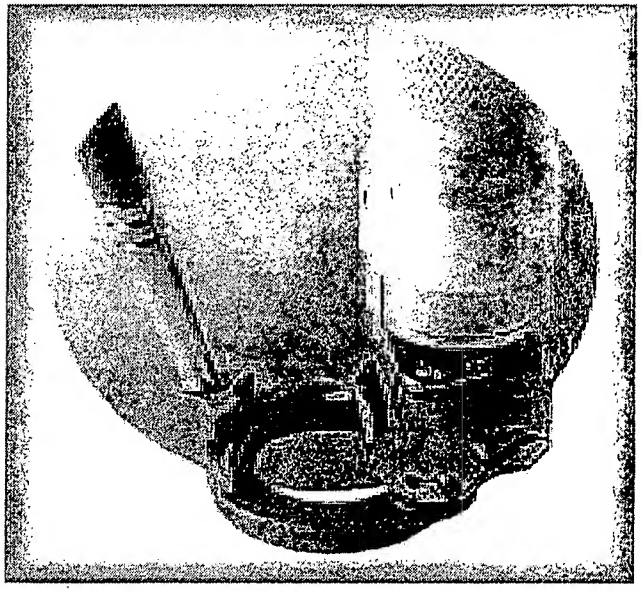


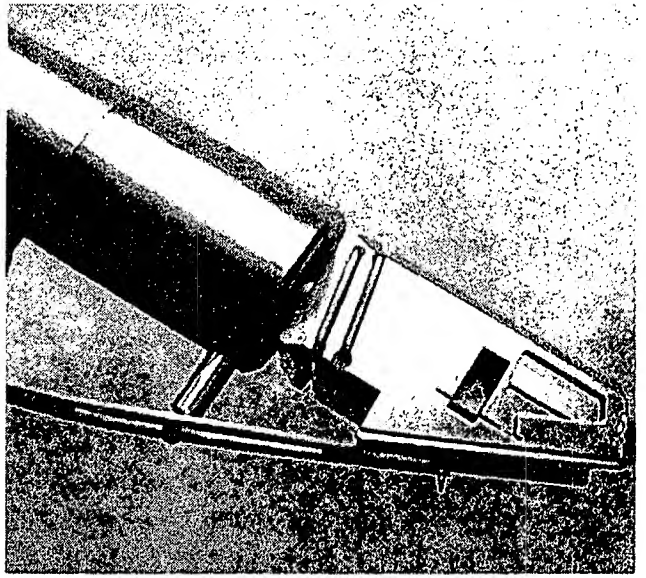
- pain
- visual rehabilitation
- haze

Laser in situ Keratomileusis (LASIK)

disadvantage:

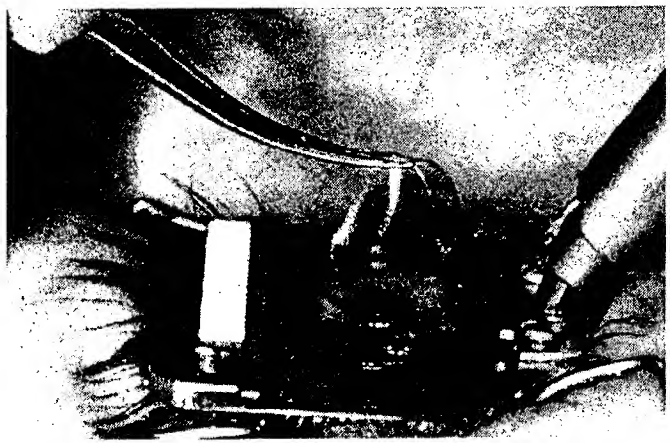
- microkeratome





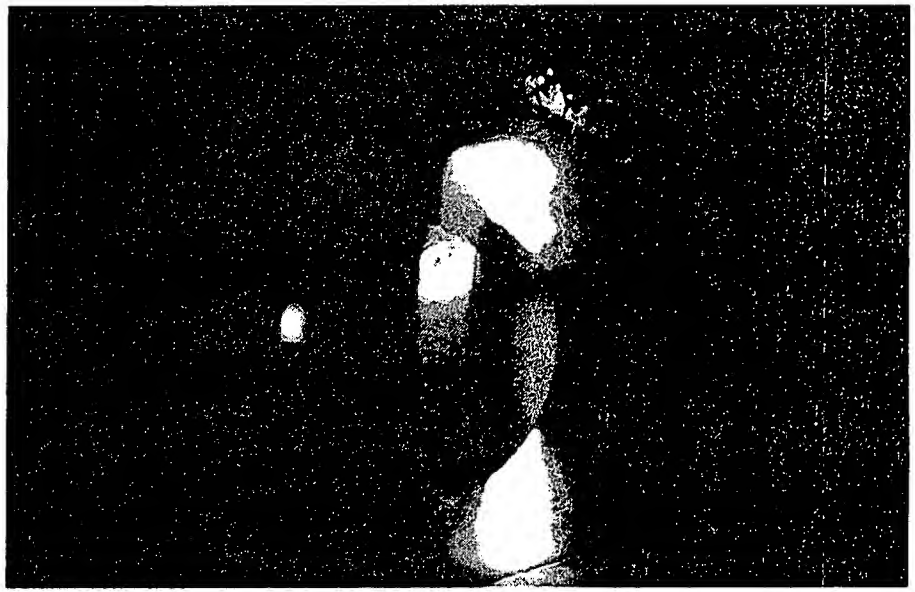
microkeratome variability

(K. Salomon, ASCRS 2002)



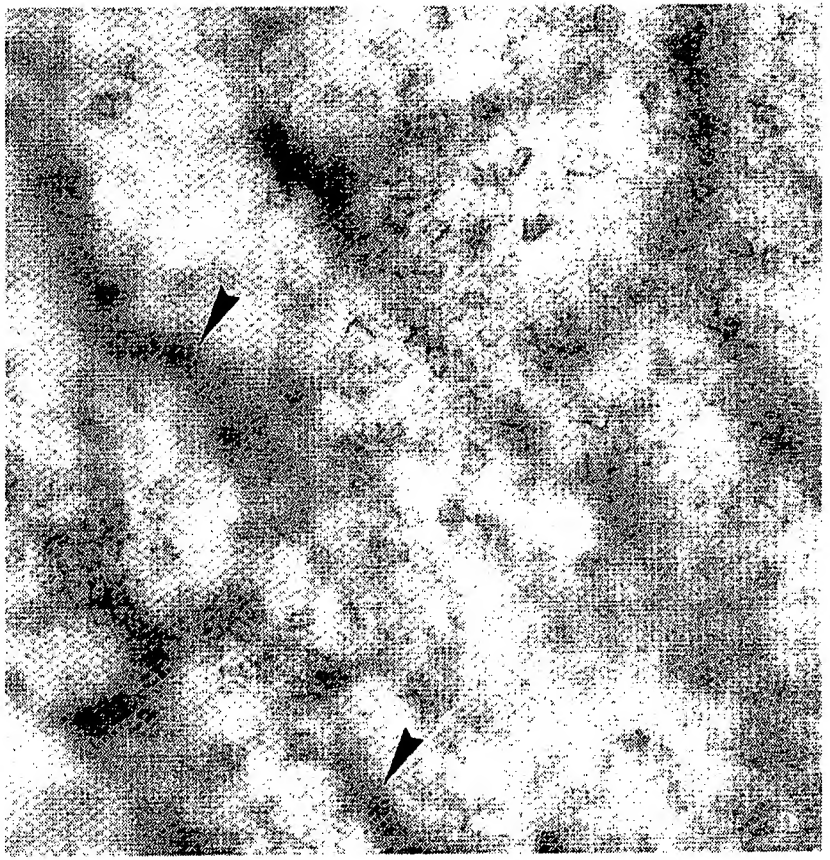
Amadeus (140)	100 – 180 µm
Amadeus (160)	110 – 250 µm
Hansatome (160)	80 – 180 µm
Hansatome (180)	80 – 180 µm
Moria (110)	110 – 220 µm
Moria (130)	140 – 240 µm
Moria (150)	160 – 250 µm

Epithelial ingrowth, Infections and DLK

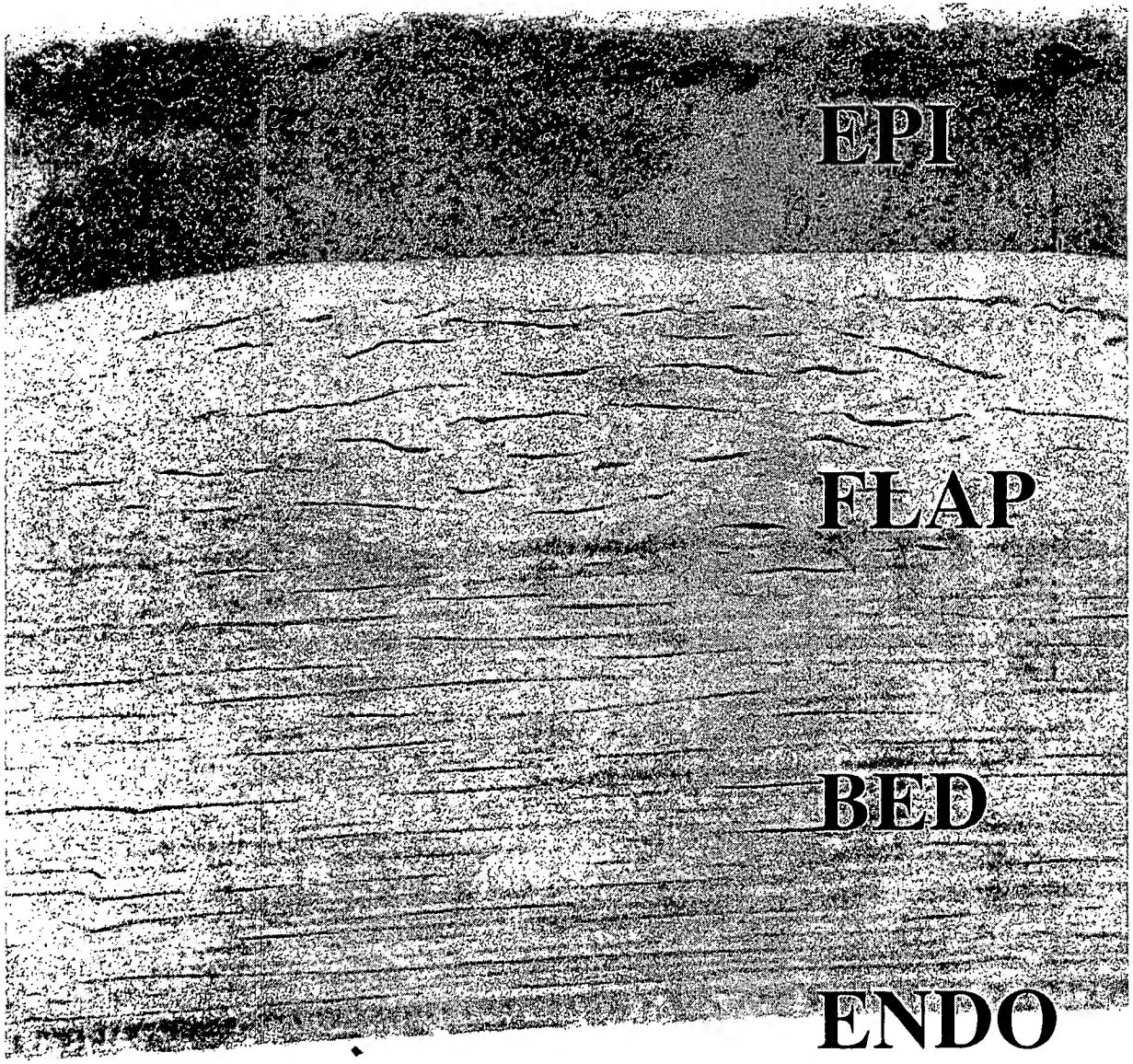


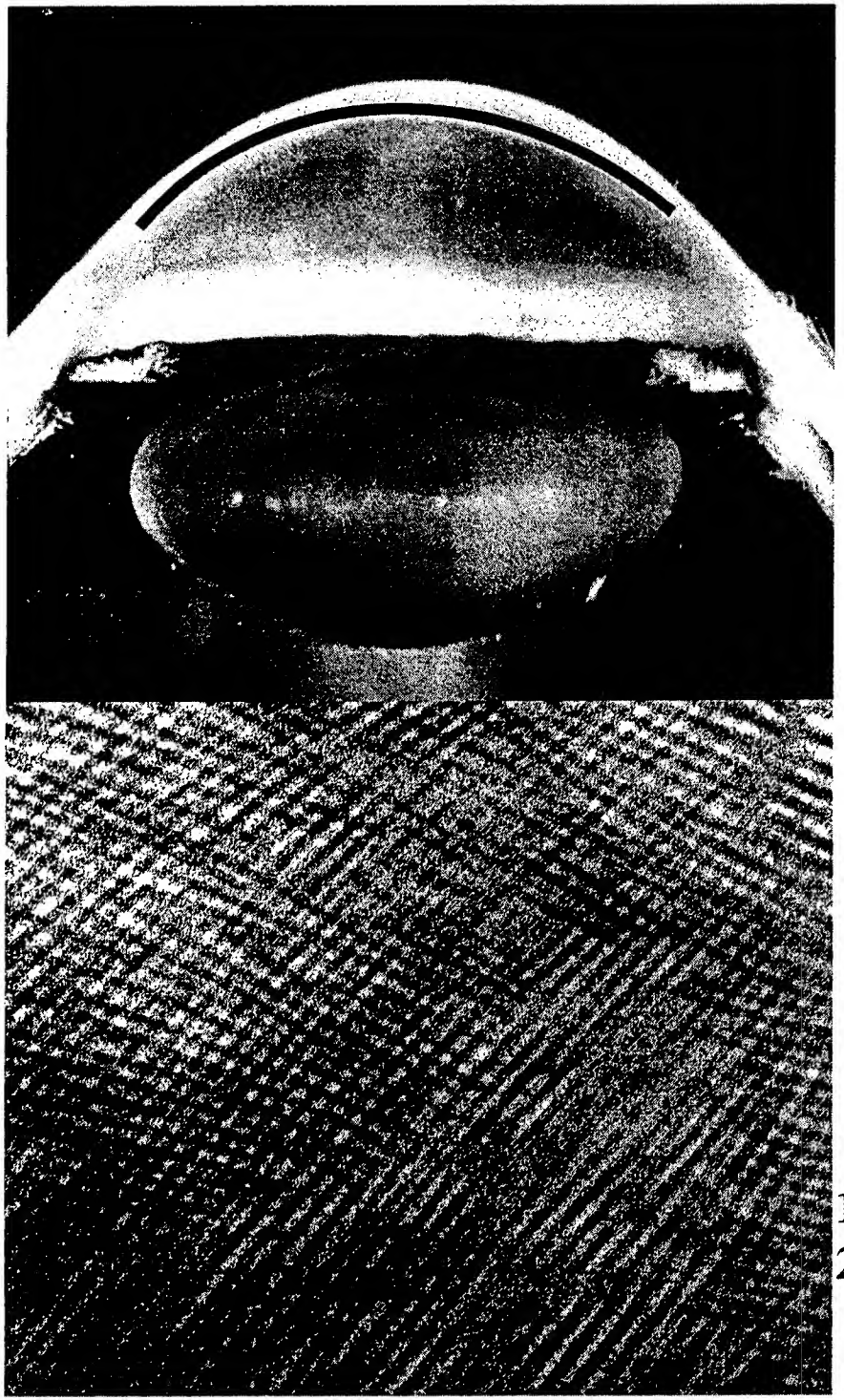
“Keratoconjunctivitis sicca”

pre LASIK



post LASIK

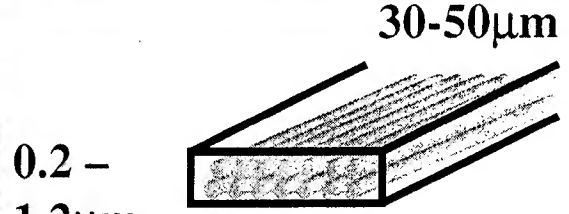

EPI
FLAP
BED
ENDO



50 μm 120 μm

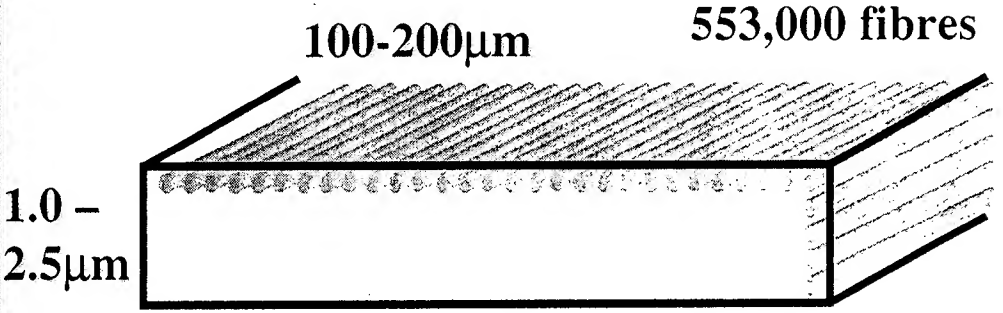
Superficial Deep

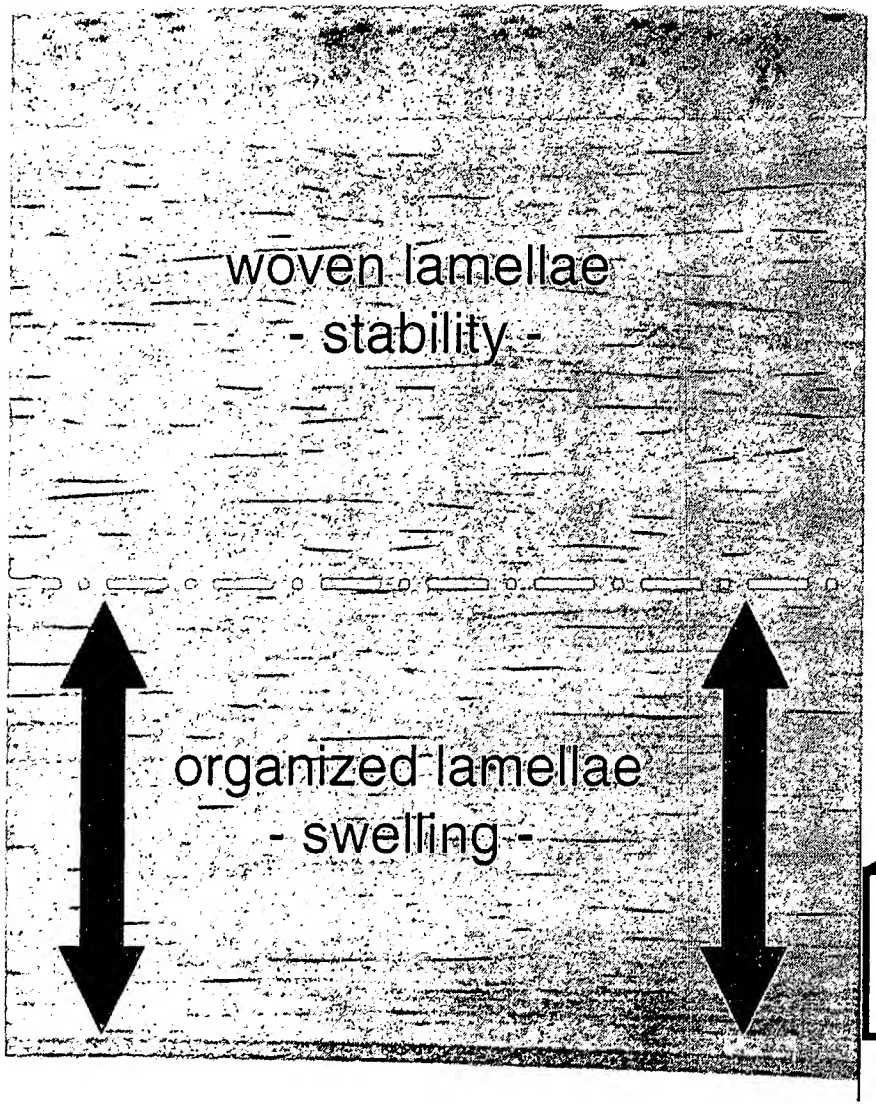
Lamellae	Lamellae
30 – 50 μm wide	100 – 200 μm wide
0.2 – 1.2 μm thick	1.0 – 2.5 μm thick



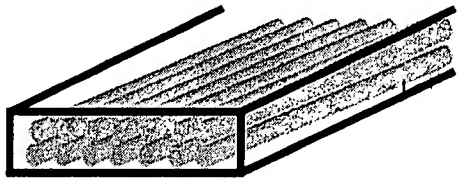
Superficial
66,640 fibres

Deep
553,000 fibres



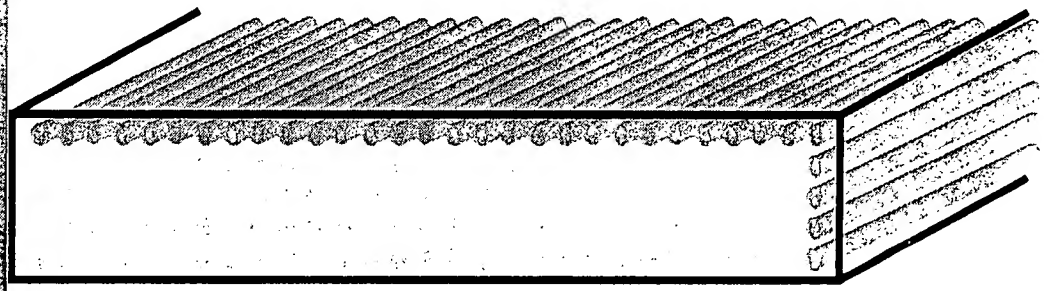


PRK & LASEK

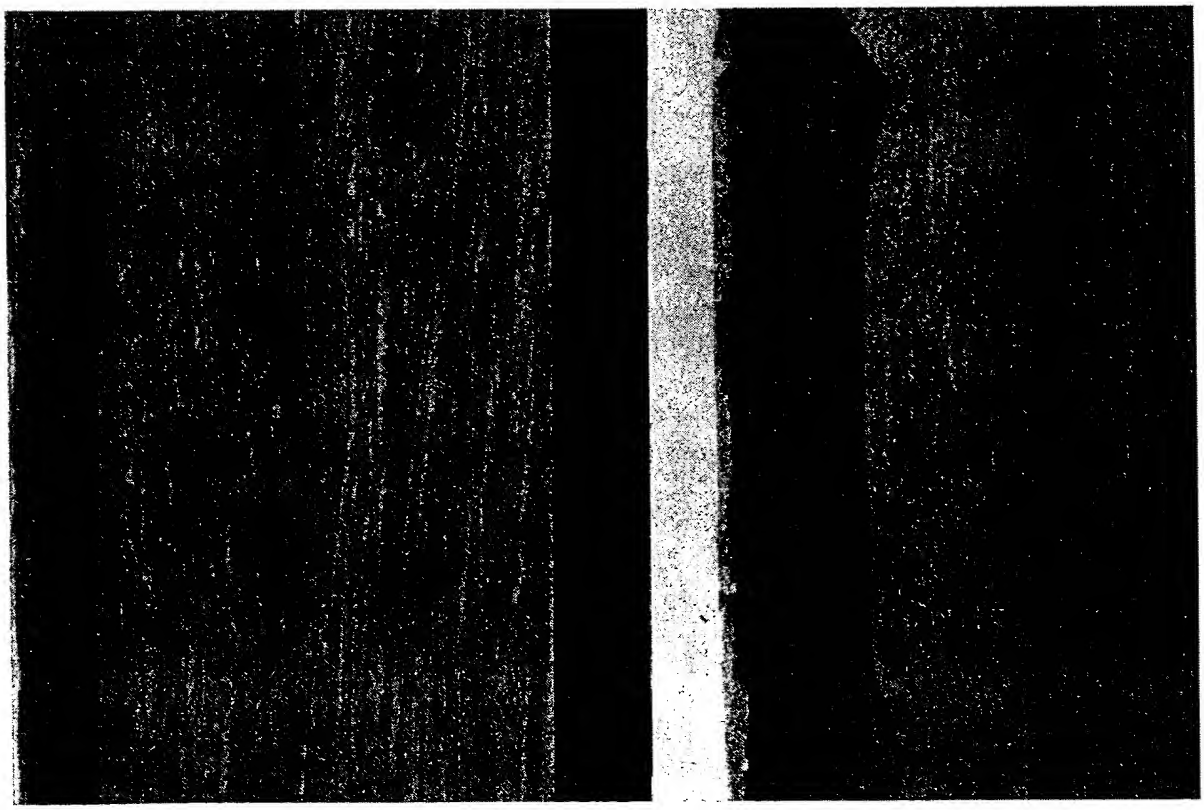


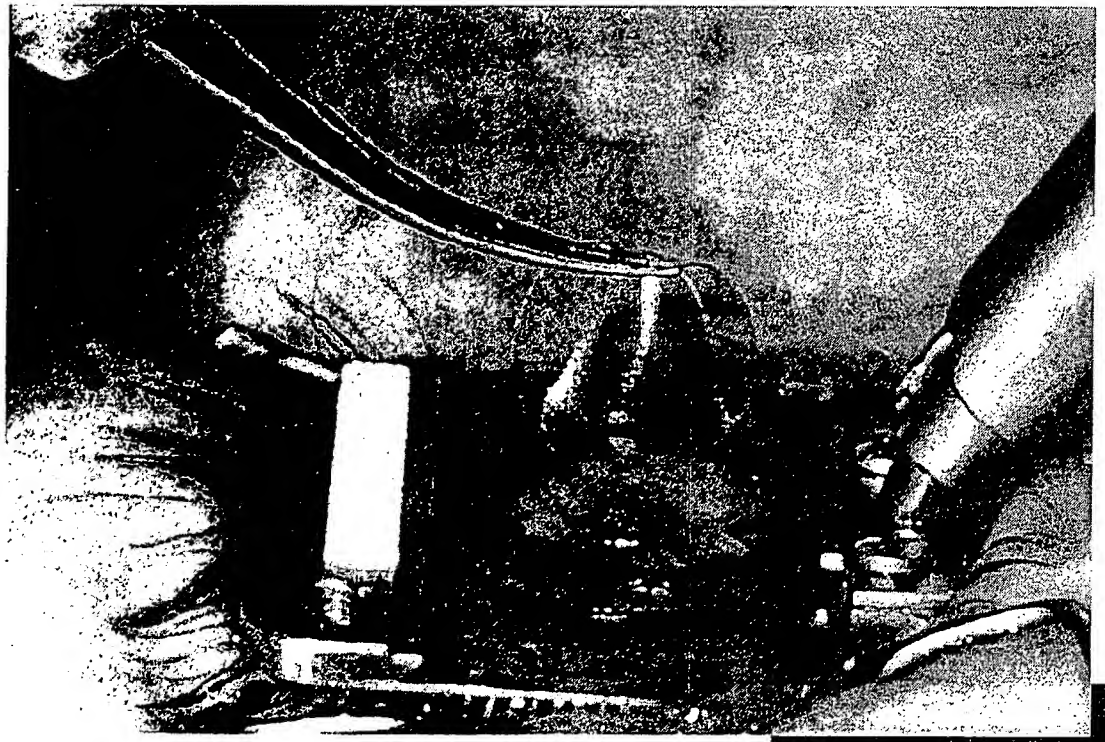
5,331,200

LASIK

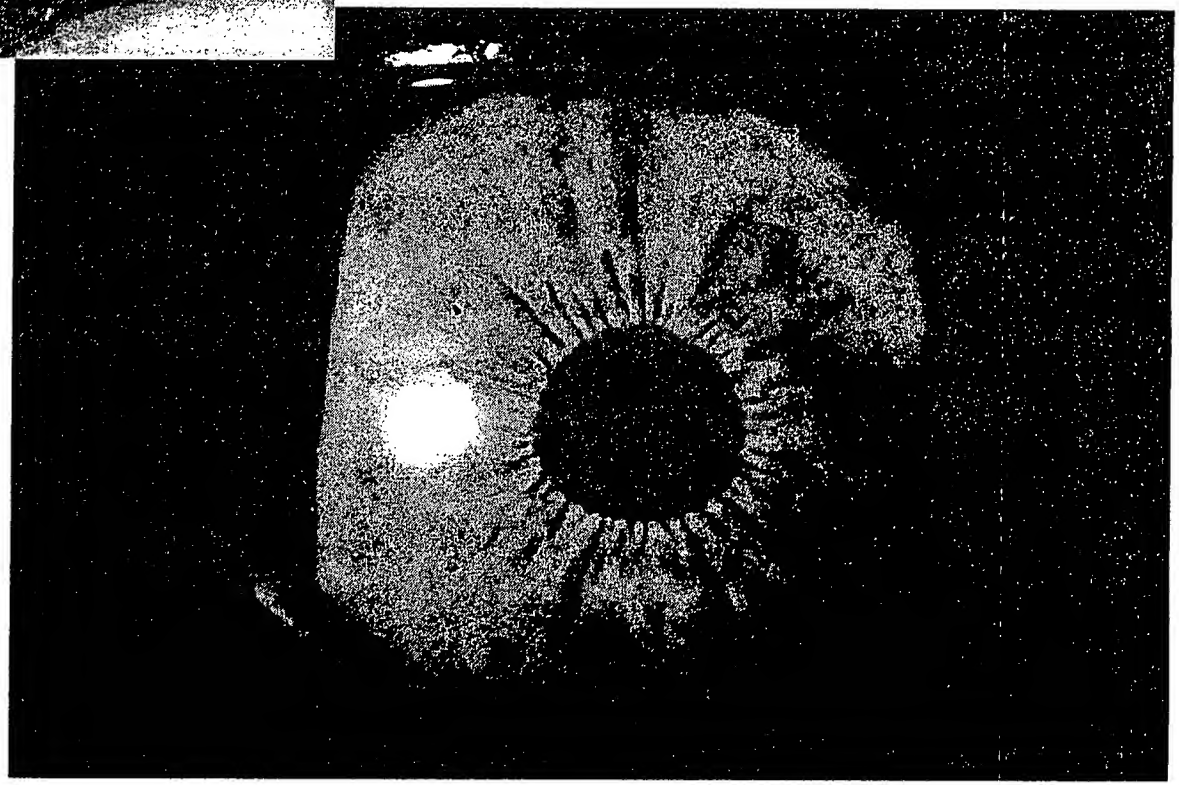


232,260,000



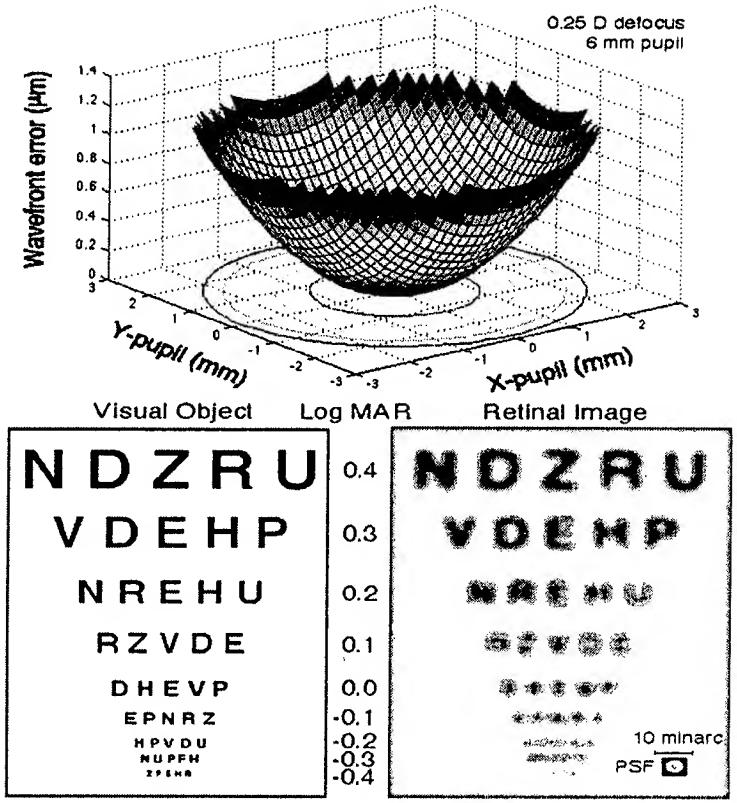


LASIK

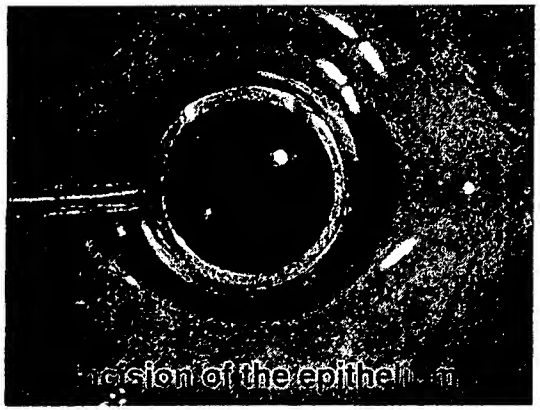


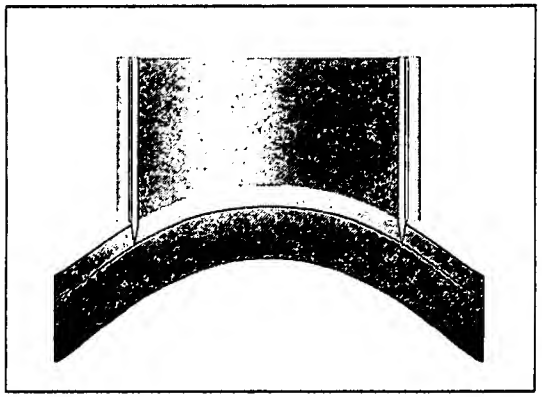
Wow-Effekt !

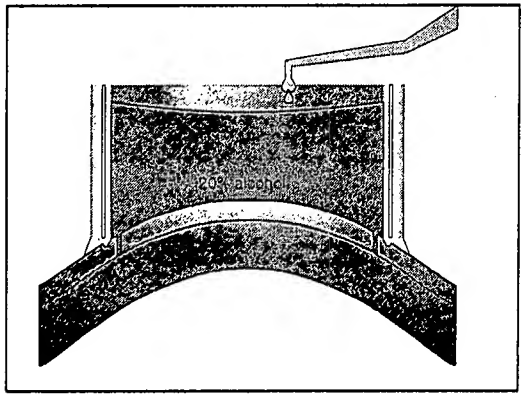
Measurement of Flap Induced Ocular Aberrations

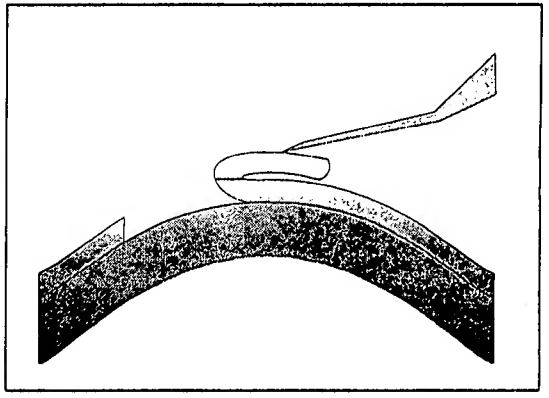


Laser Epithelial Keratomileusis (LASEK)

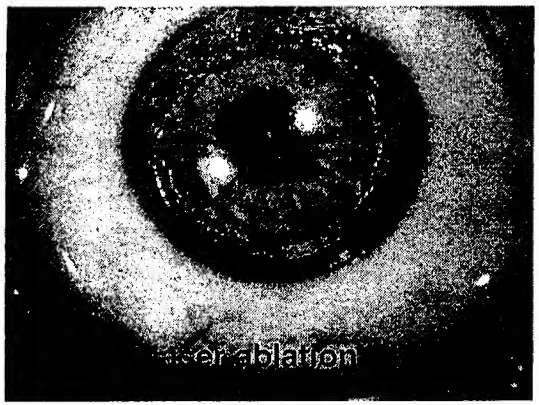


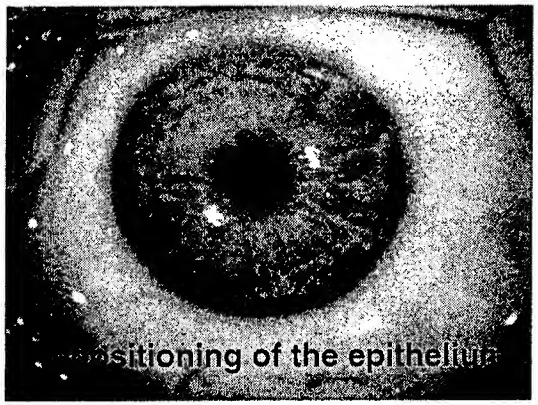


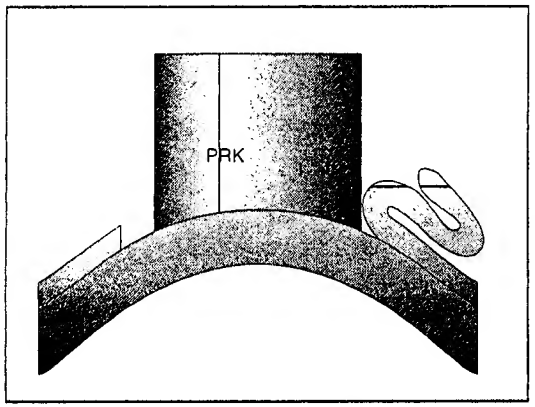


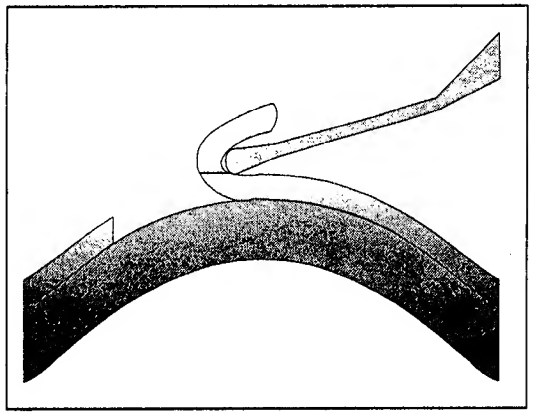


Laser Epithelial Keratomileusis (LASEK)



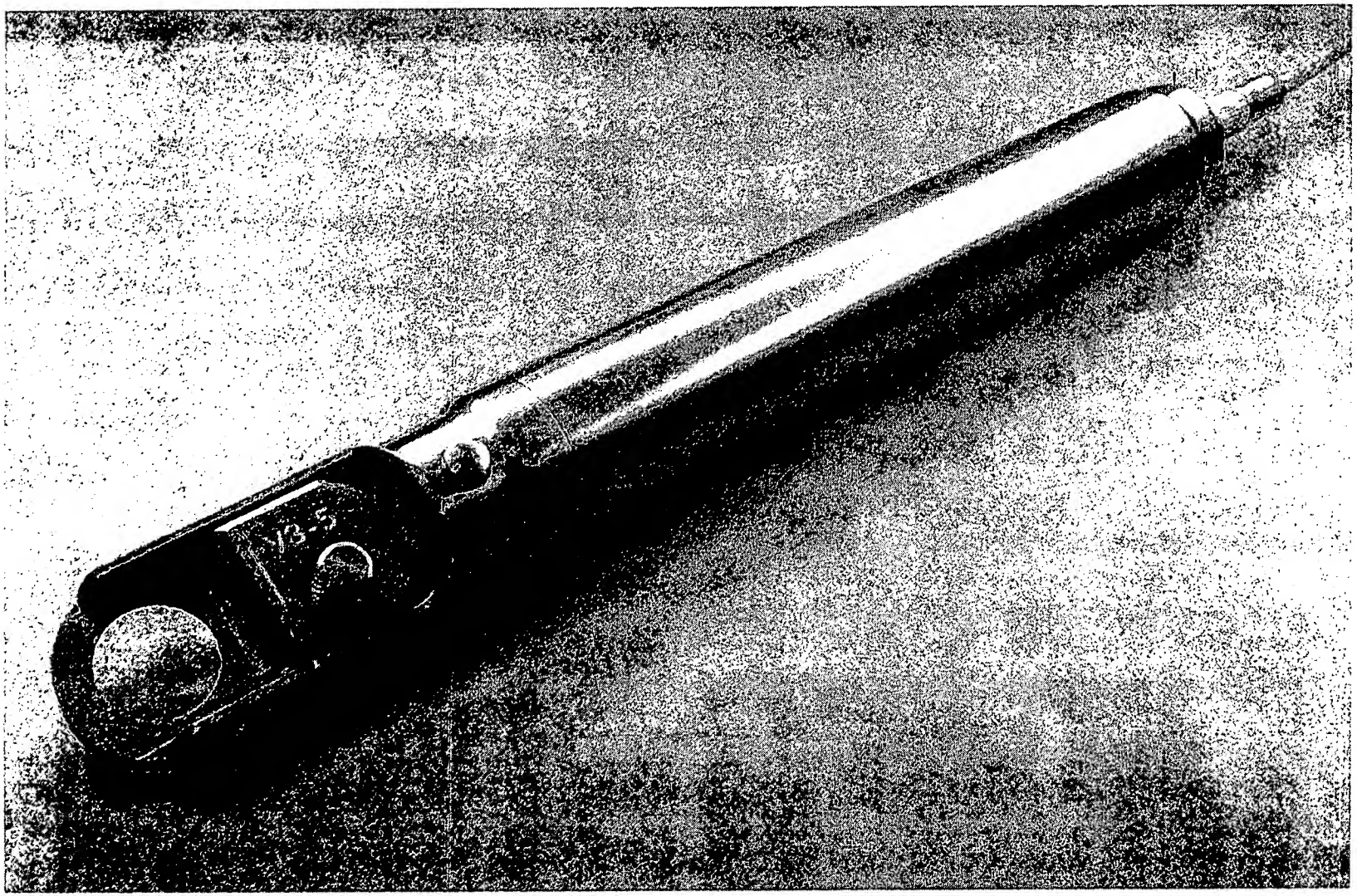






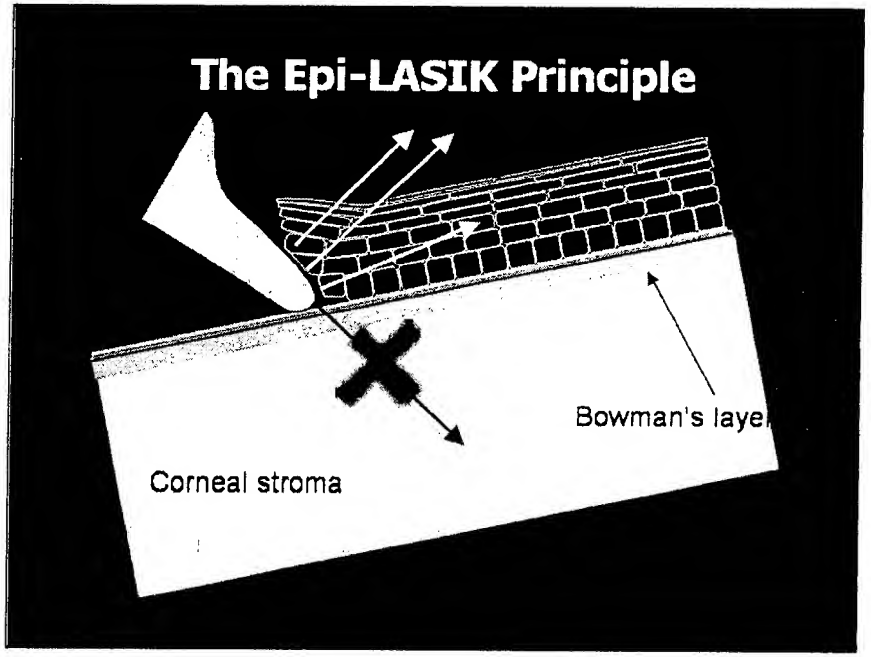
advantages
of PRK and LASIK
without
their disadvantages

Epi – LASIK with Norwood Abbey SES



Epi-LASIK Technique

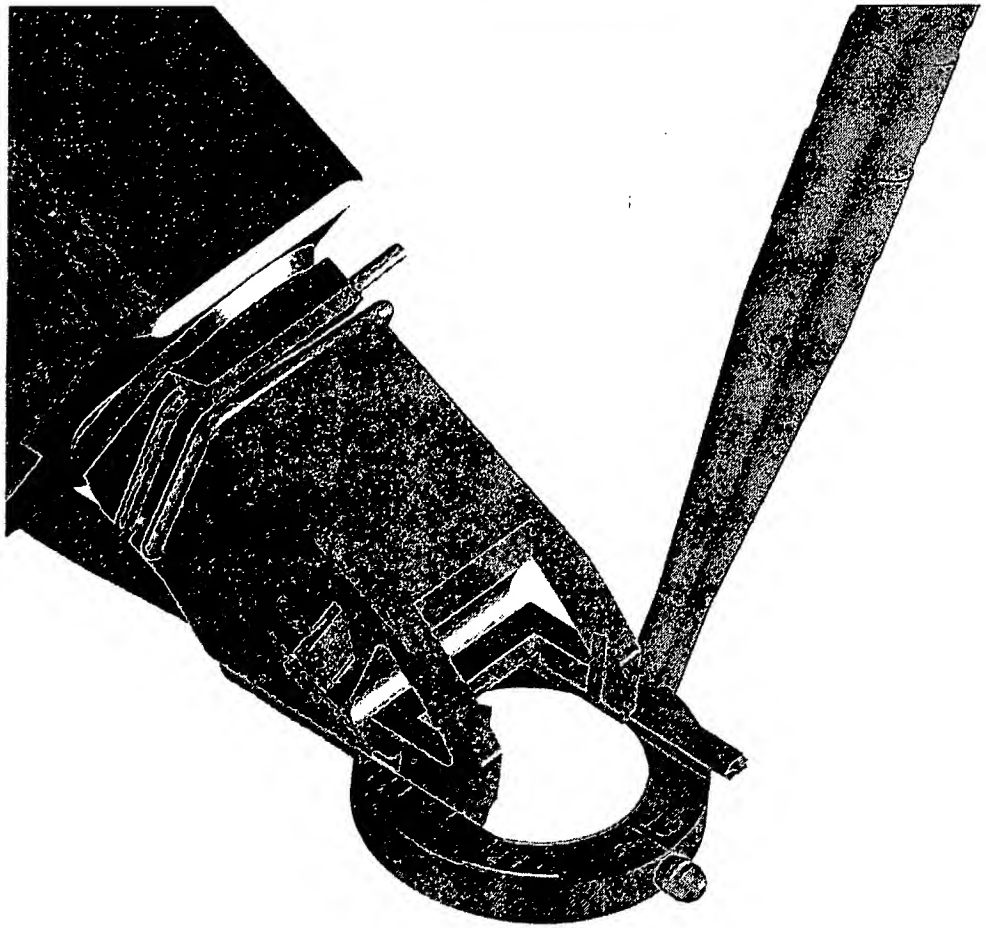
- **Pallikaris et al***
- **Epithelial flap**
- **Cleavage principle**
- **No alcohol**

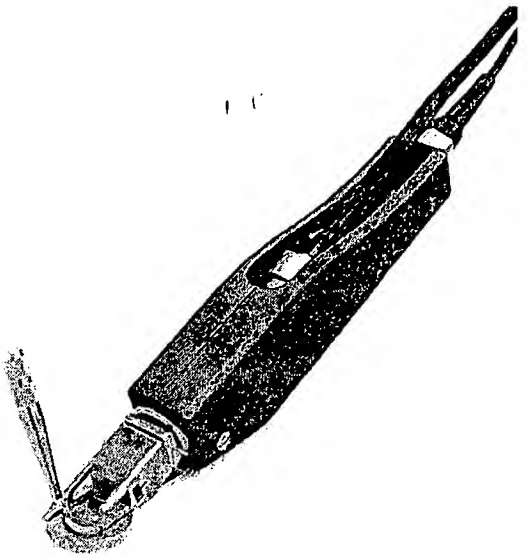


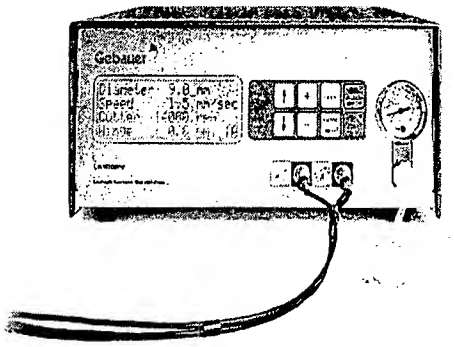
* Pallikaris, IG et al. Epi-LASIK: Comparative histological evaluation of mechanical and
Alcohol-assisted epithelial separation. *J Cataract Refract Surg 2003; 29:1496-1501*

Epi-Lasik / LASEK without alcohol

- Gebauer Epitome -



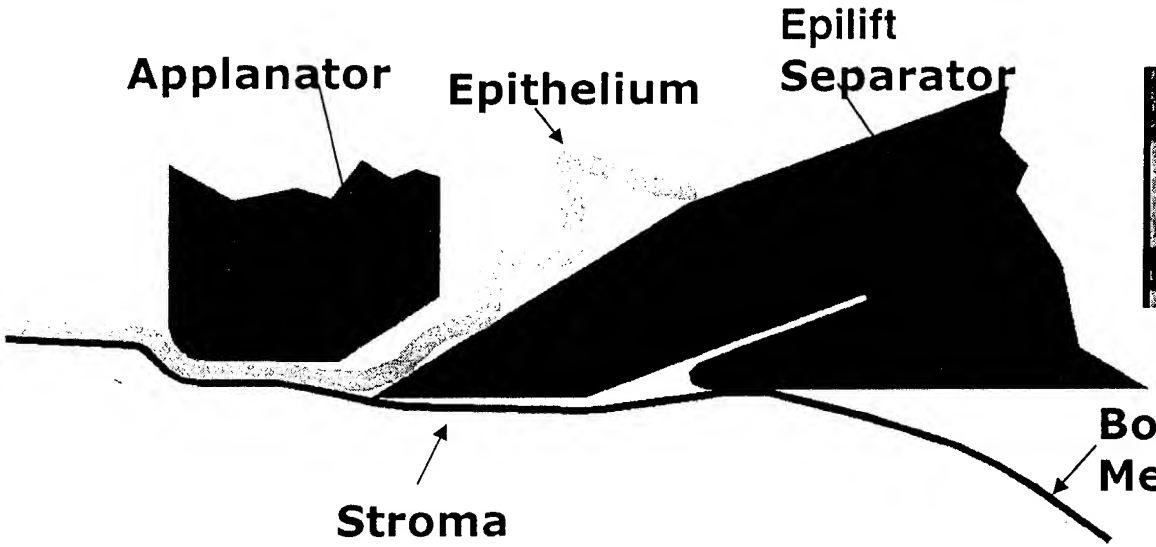


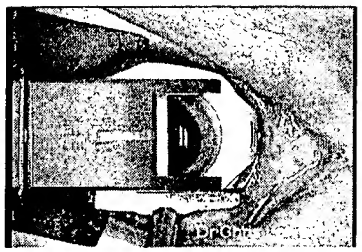


Epi-Lasik / LASEK without alcohol

- Gebauer Epitome -

How does the Gebauer System work ?





- The applanator "flattens" the cornea in advance of the edge of the EpiLift's edge.

- The distance between the applanation bar and the SurEdge is fixed (160 microns). Therefore, the Epithelial anatomy is consistently delivered in optimal alignment for separation.

- The EpiLift has a downward force blade angle (top) and an upward force angle (bottom) which assures a pathway of separation parallel to & on top of Bowman's membrane.

Nomogram for EPI ring size

Use Standard Settings for Epi-Lasik / LASEK with Lasitome

table 1:

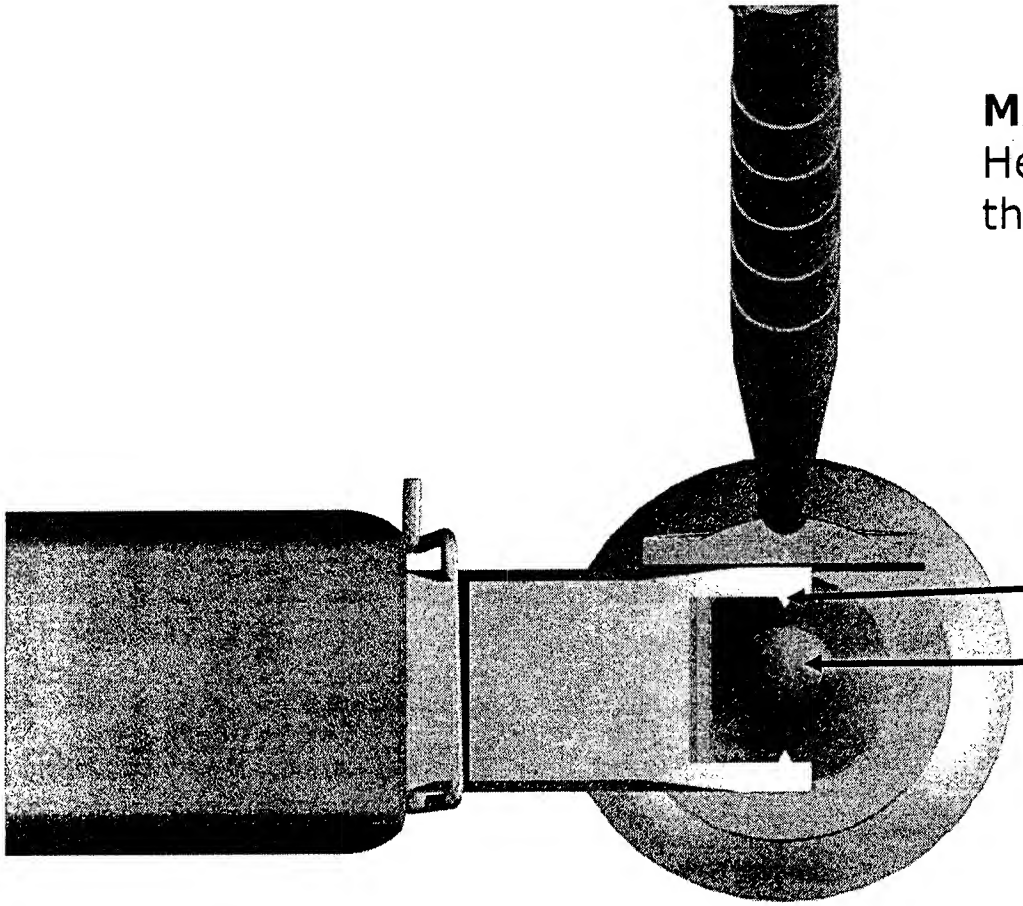
Diameter:	9.0 mm
Speed:	1.0 mm / sec.
Hinge:	0.5 mm

table 2:

FLAP-DIAMETER expected / K-READING	8,0 - 8,5 mm (set 8.0 mm)	8,5 - 9,0 mm (set 8.5 mm)	9,0 - 9,5 mm (set 9.0 mm)	9,5 - 10,0 mm (set 9.5 mm)	10,0 - 10,5 mm (set 10.0 mm)
37 dpt	EPI-Head 19/4 or 21/4 Ring	EPI-Head 19/3 or 21/3 Ring	---	---	---
40 dpt.	---	EPI-Head 19/4 or 21/4 Ring	EPI-Head 19/3 or 21/3 Ring	---	---
43 dpt.	---	---	Epi-Head 19/4 or 21/4 Ring	EPI-Head 19/3 or 21/3 Ring	---
46 dpt	---	---	---	EPI-Head 19/4 or 21/4 Ring	EPI-Head 19/3 or 21/3 Ring

Note: In case of K-reading < 40 dpt. or in case of wavefront guided ablation use the recommended Diameter setting in table 2.

Anatomical attachment of EPI head



MARKINGS – of the EPI-Head to find the centre of the pupil

PUPIL - Make sure that the pupil is exactly in the middle of between

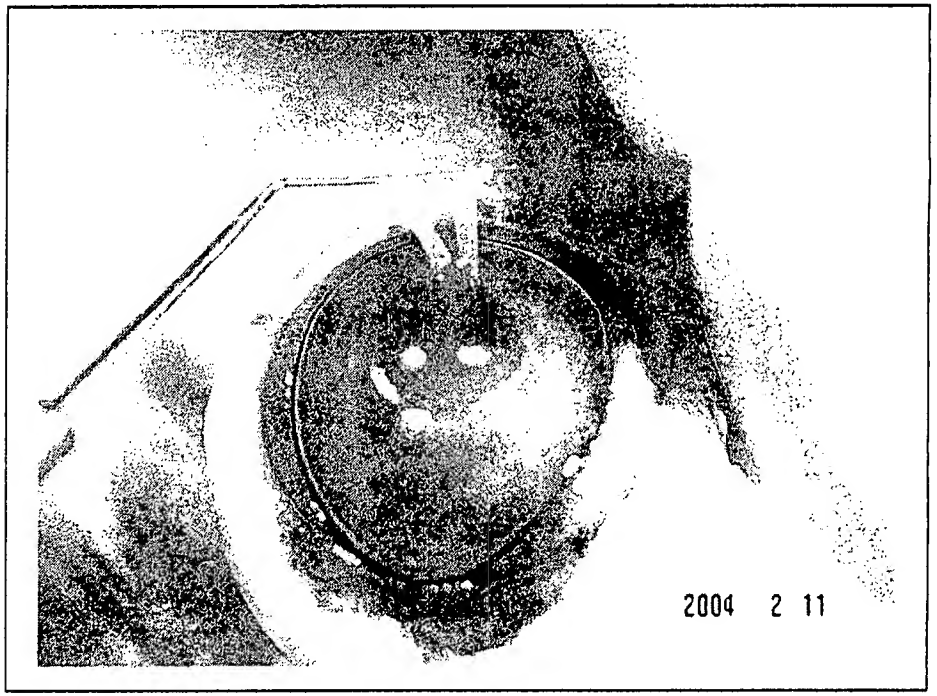
Lasitome: Experimental studies

Purpose:

- *Morphological analysis*
- *Establish safe parameters*

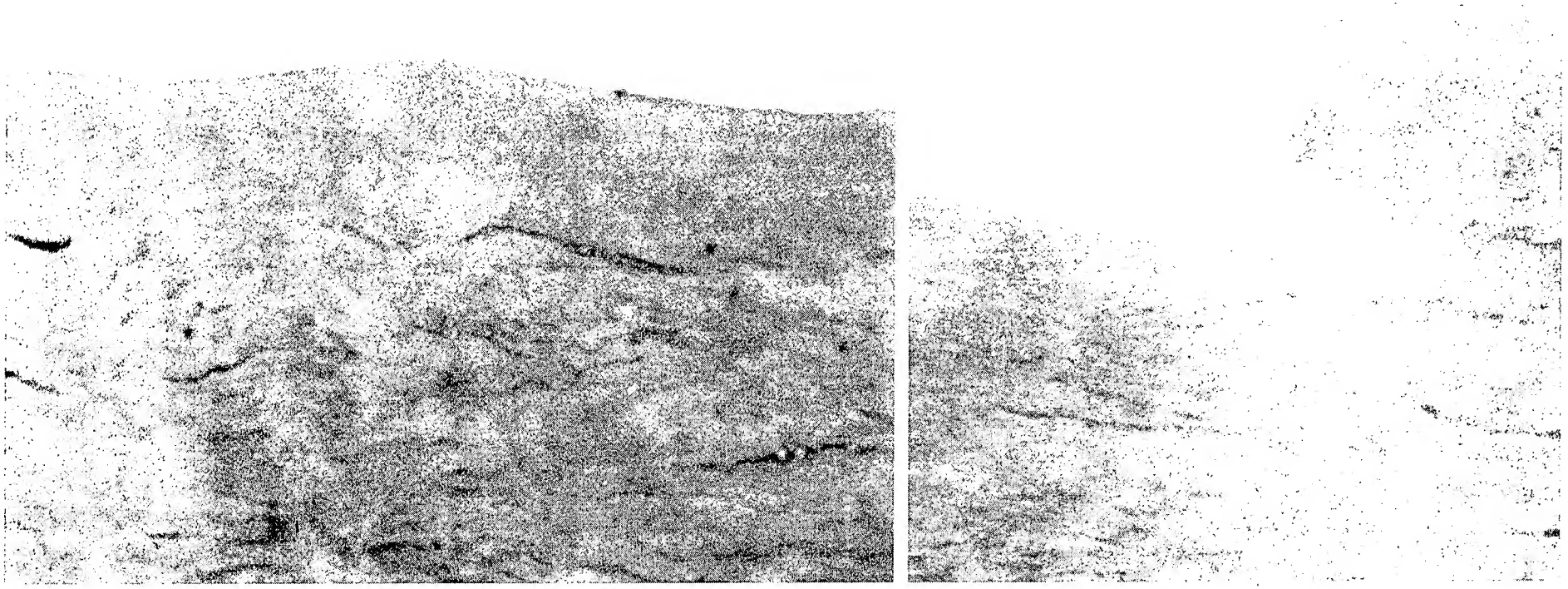
Methods

- *Porcine corneas*
- *Human corneas (Eye banks)*



Epi-Lasik / LASEK without alcohol

- Gebauer Epitome – Chris P. Lohmann

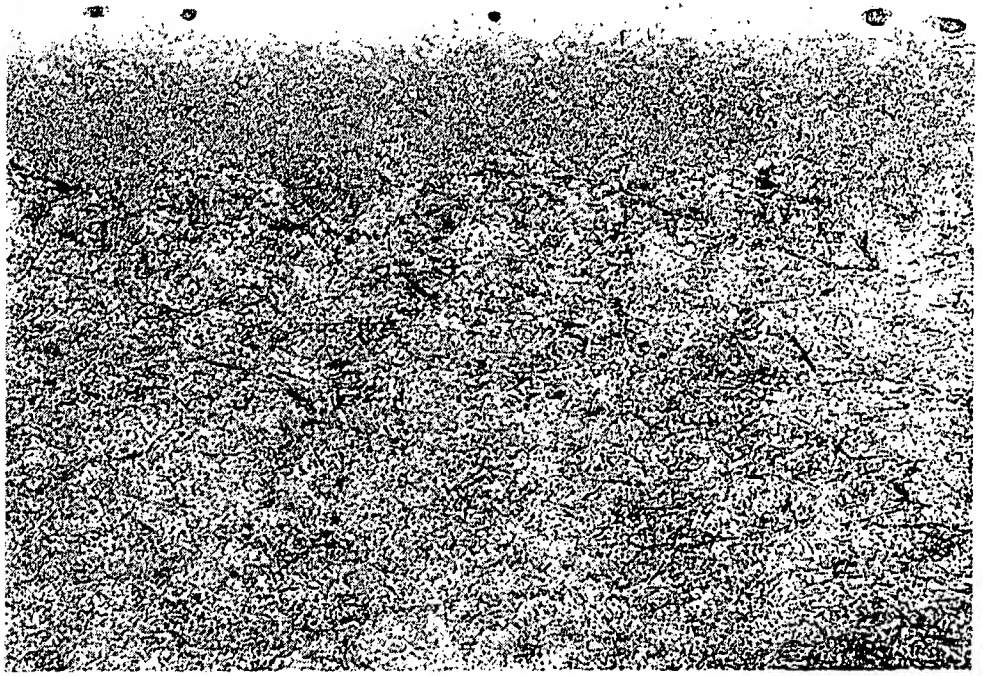


Lightmicroscopy:

- sharp cut at the epithelium
- very smooth surface
- no damage to Bowman's layer

Epi-Lasik / LASEK without alcohol

- Gebauer Epitome – Chris P. Lohmann

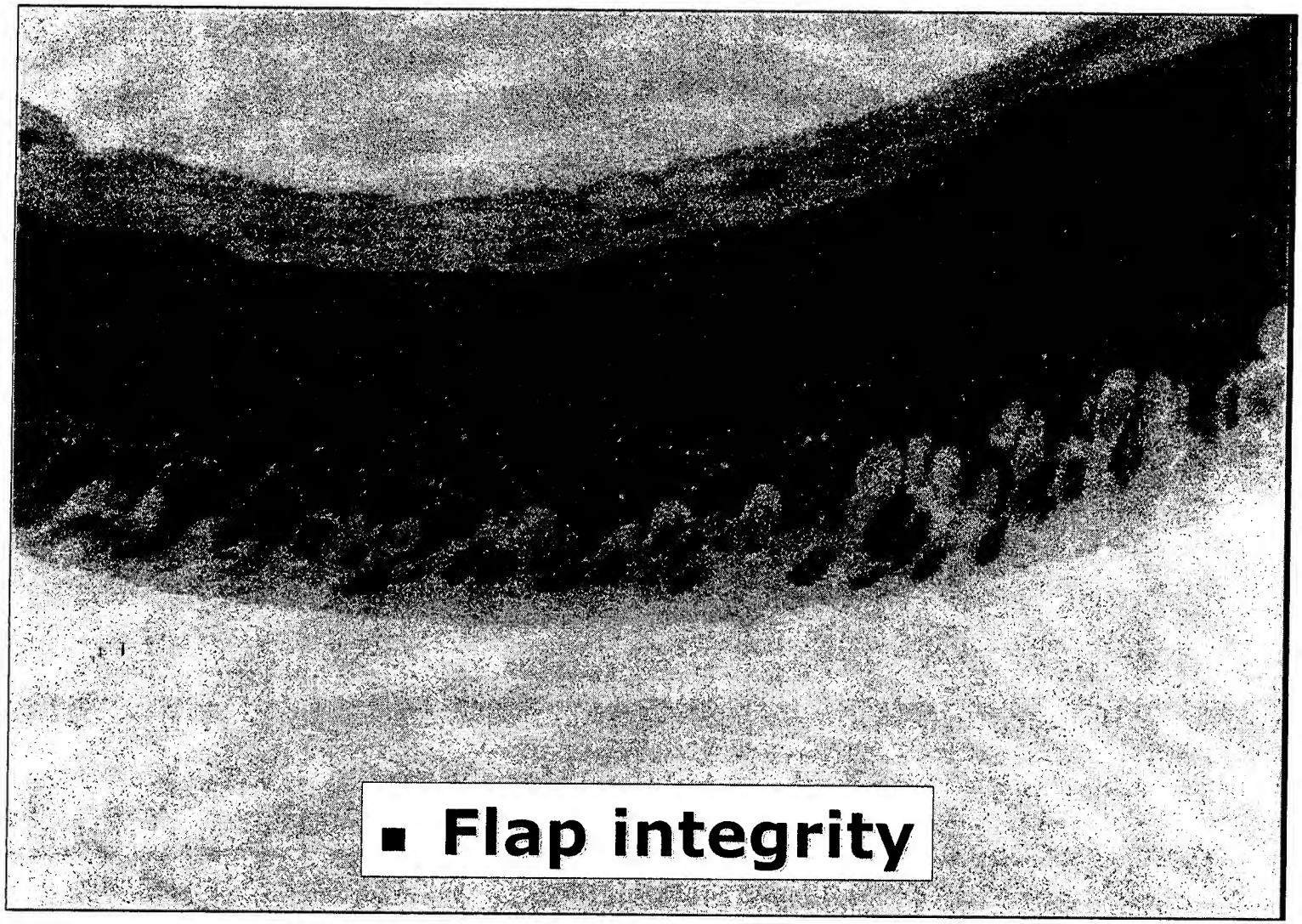


Electronmicroscopy:

- no damage to epithelial cells
- intact basalmembrane
- smooth Bowman's surface

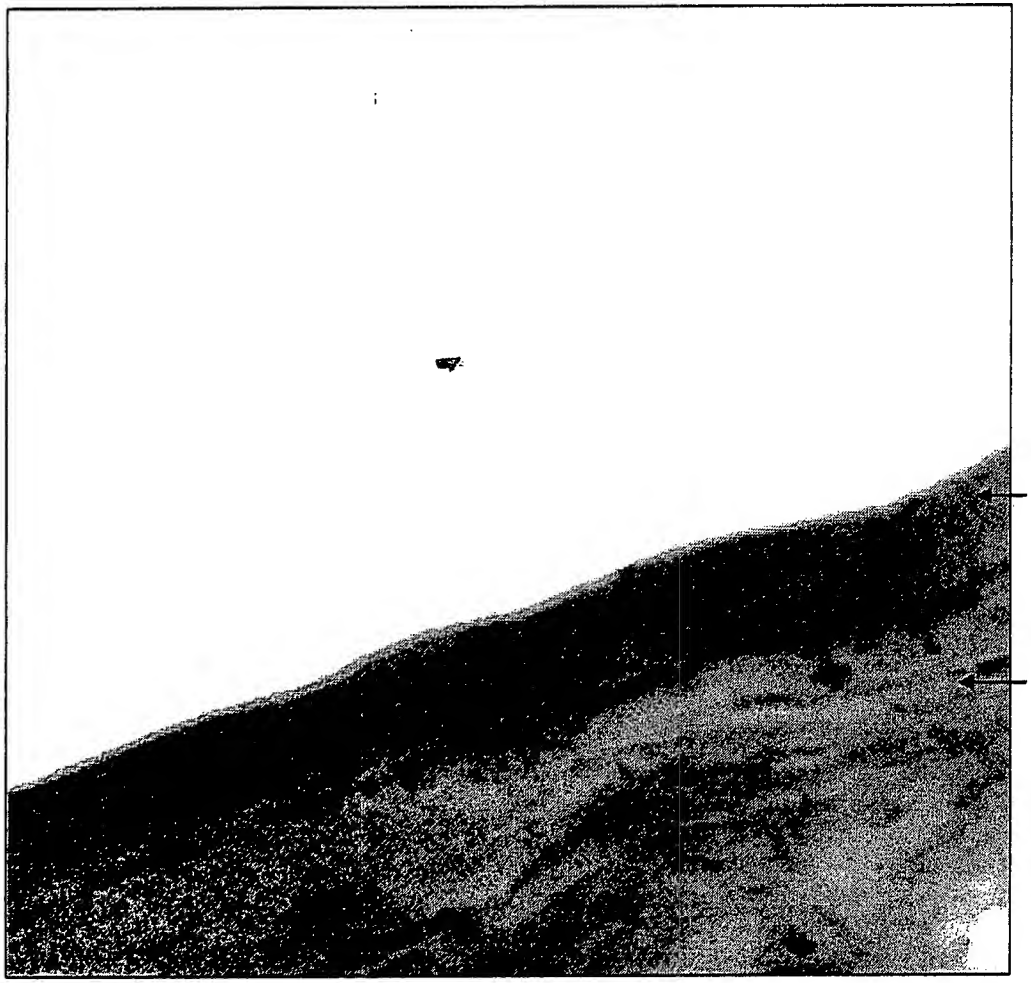
Epi-LASIK: Morphology

Marcello Netto, Cleveland



Stromal Integrity

Marcello Netto, Cleveland



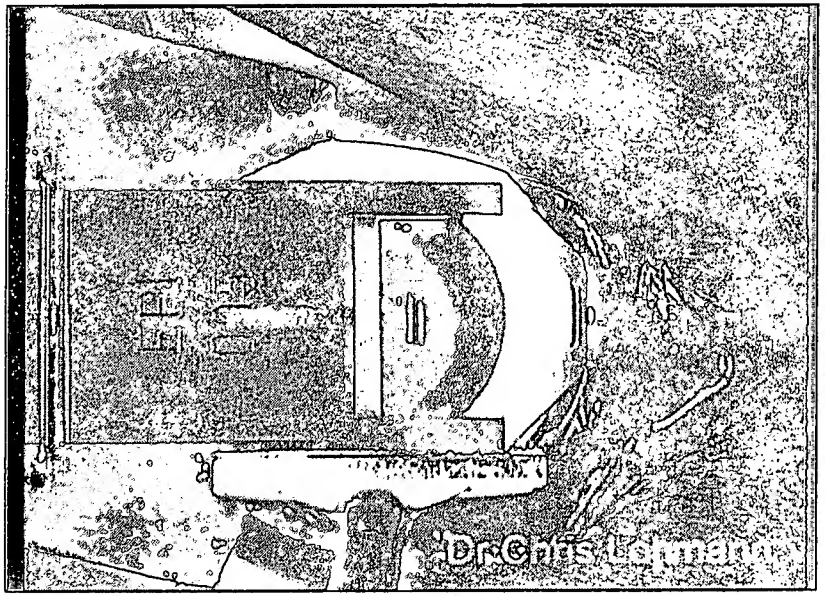
Epi-LASIK: Morphological findings

Marcello Netto, Cleveland

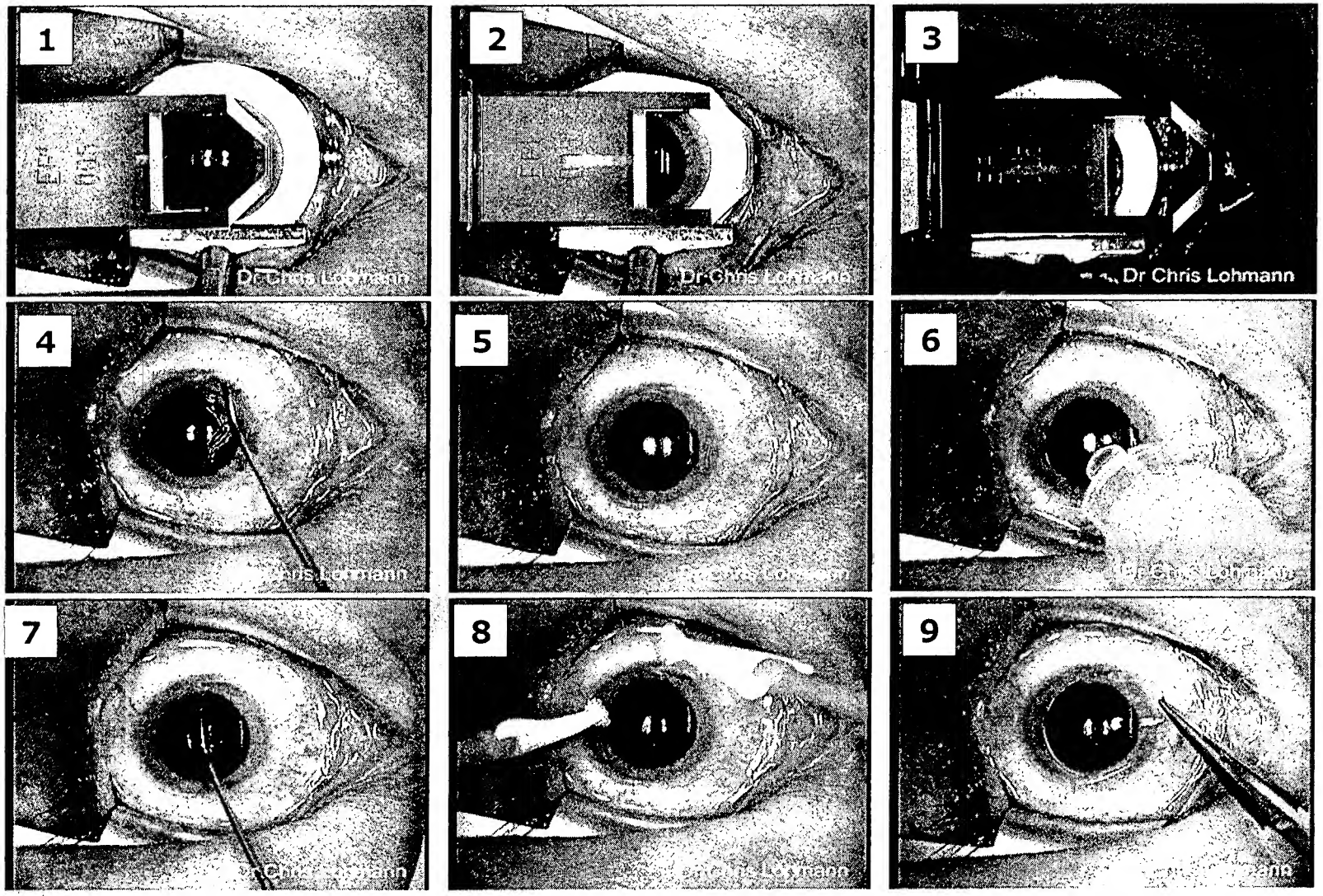
- Epithelial flap integrity
- Stromal integrity
- Intact intercellular adhesion
- Intact intracellular contents
- Micro-focal disruptions at the basement membrane

Present experience

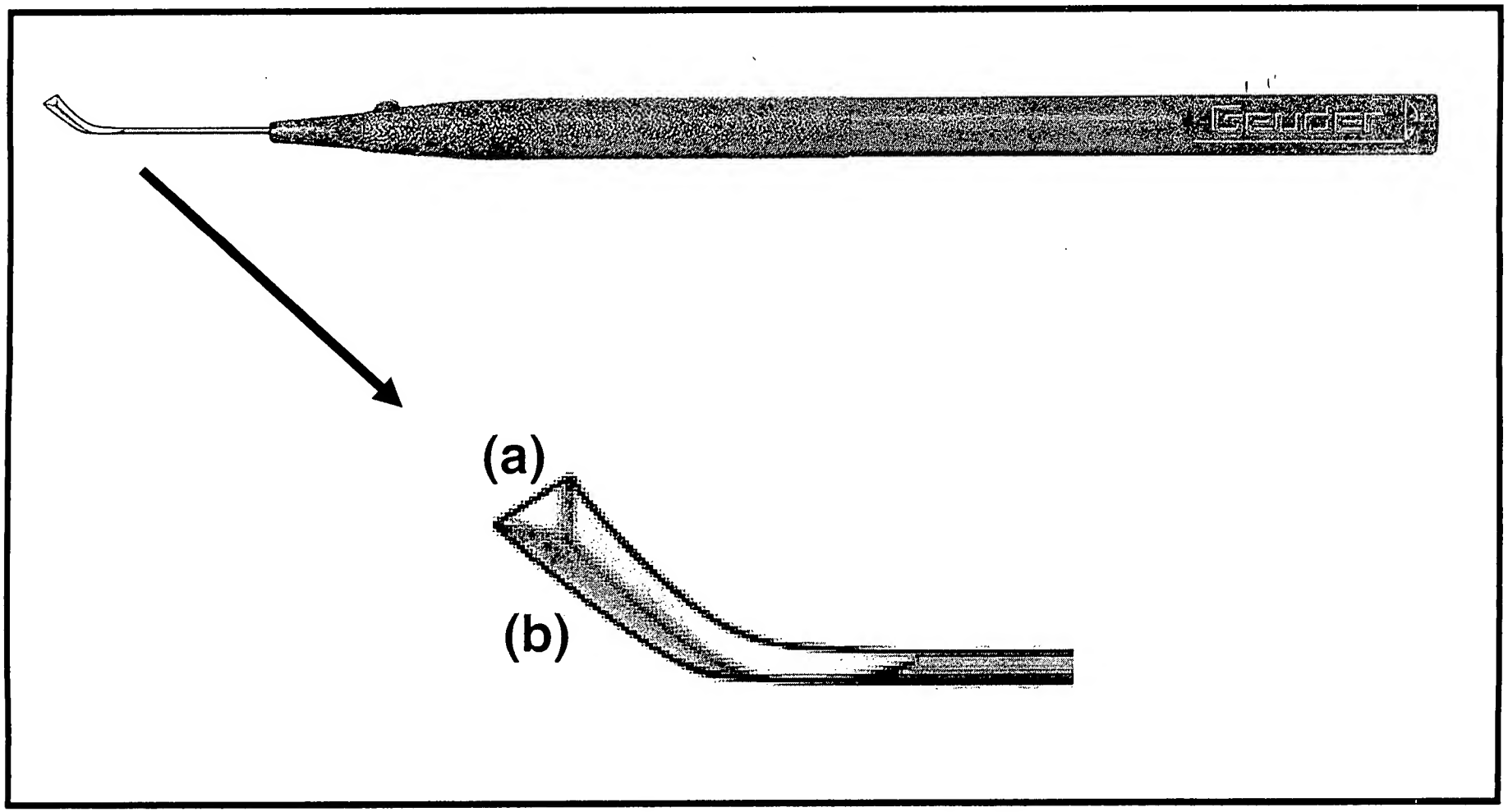
- No FDA approval
- European experience
- US: experimental studies



Epi-Lasik / LASEK without alcohol



Epi-peeler (Geuder, Germany; www.geuder.de)



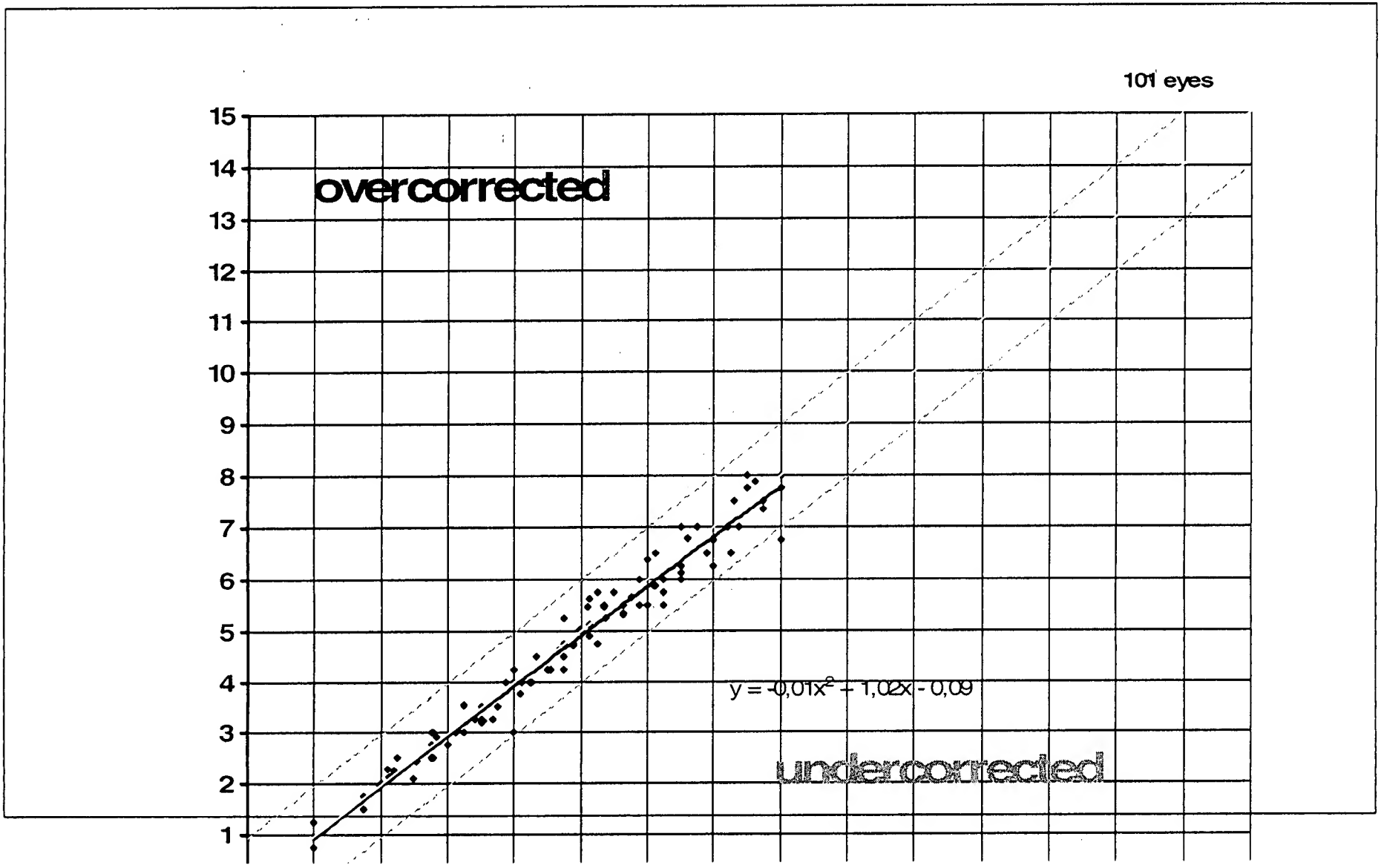
Epi-Lasik / LASEK without alcohol

- Gebauer Epitome – Chris P. Lohmann

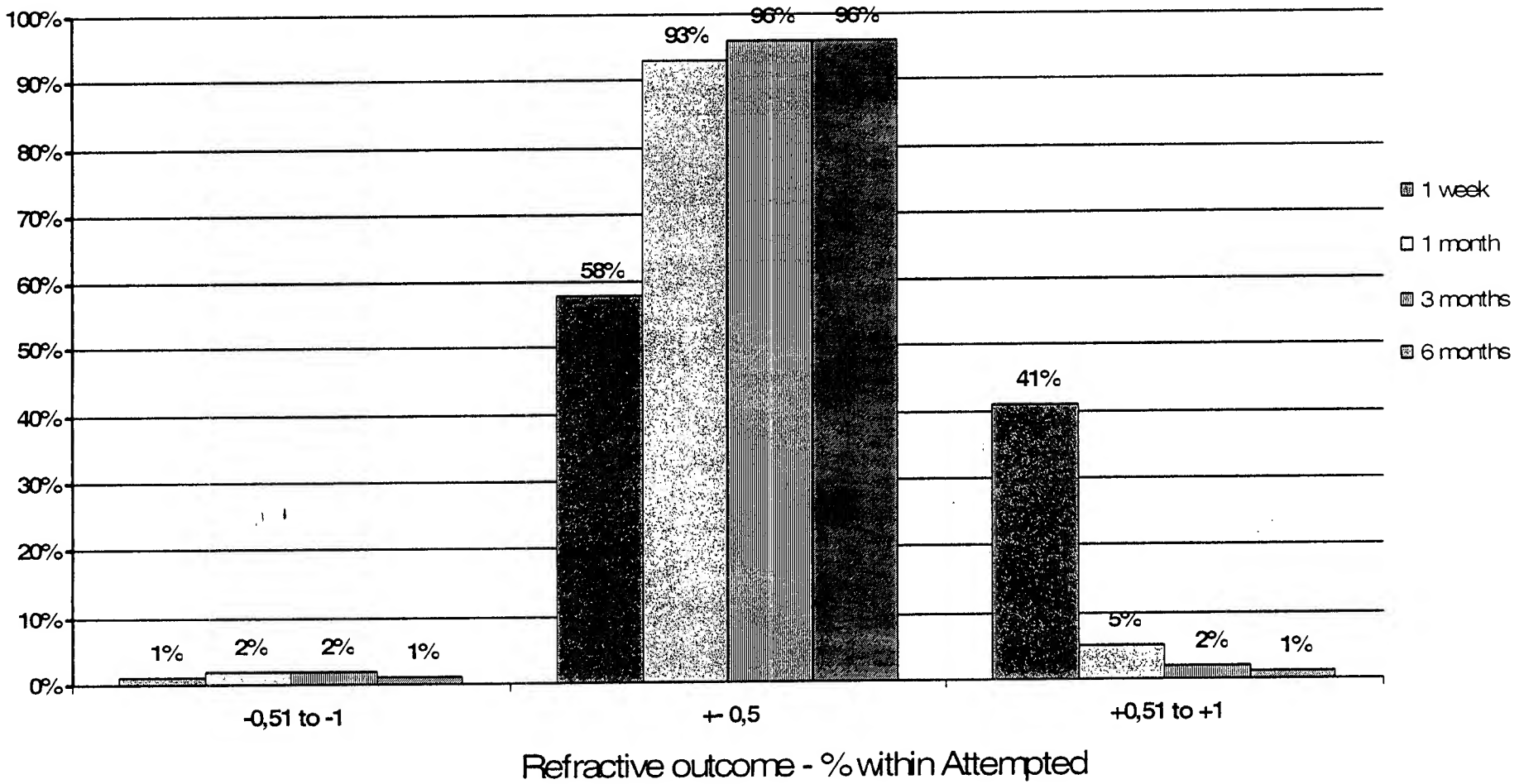
my clinical experience:

- 243 myopic and astimatic eyes (-1.25 to – 8.0 D)
- no flap problems
- no intraoperative pain
- no intraoperative "light out""
- contact lens removal after (1) or 2 or 3 days

Epi-Lasik / LASEK without alcohol
- Gebauer Epitome -



Epi-Lasik / LASEK without alcohol
- Gebauer Epitome -



Epi-Lasik / LASEK without alcohol
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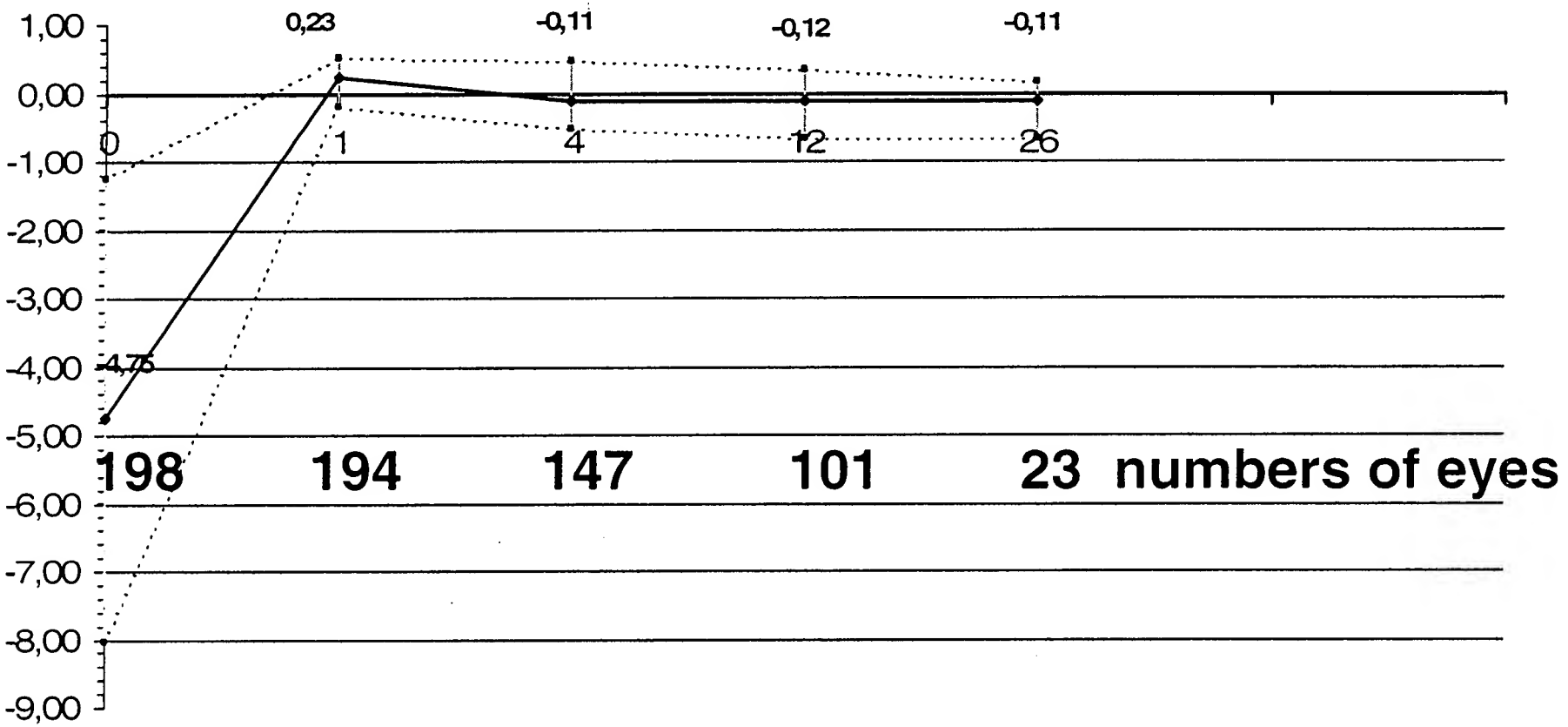
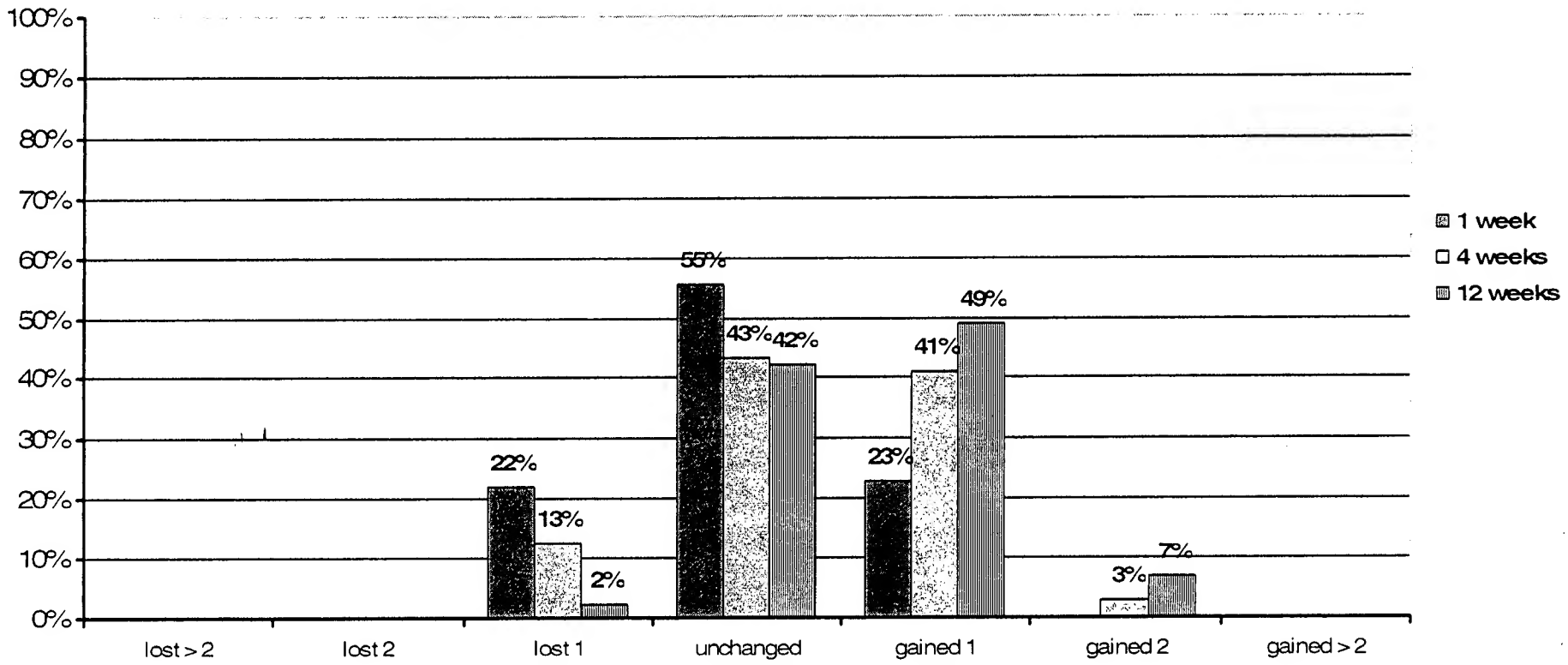


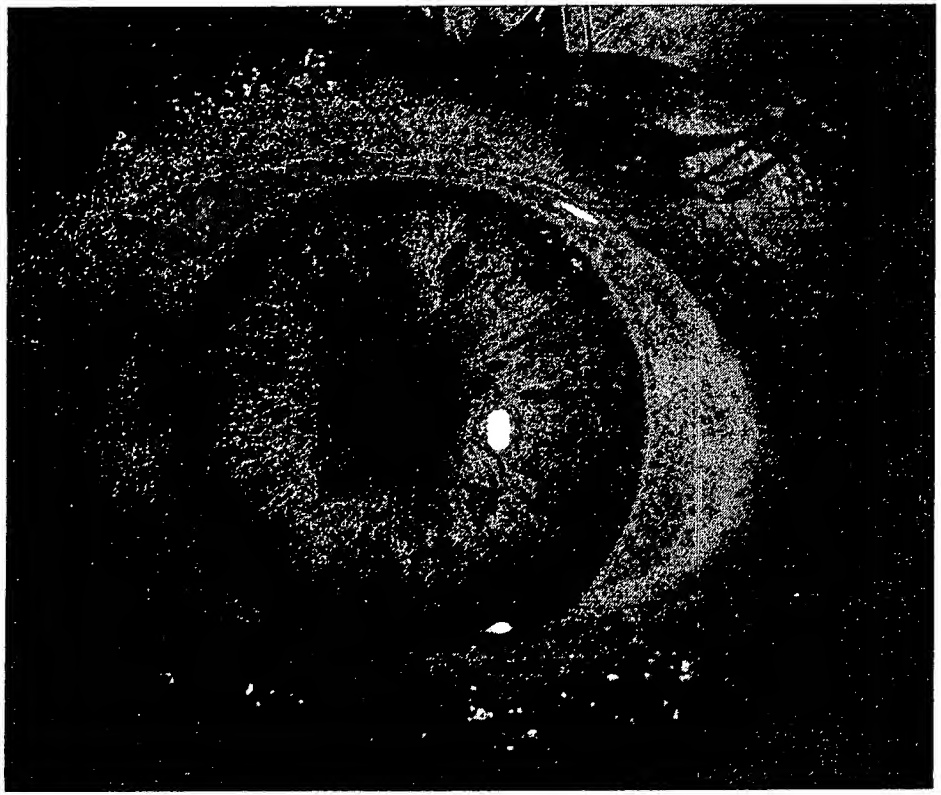
STABILITY: Achieved Change in Refr. over Time (weeks)

Epi-Lasik / LASEK without alcohol
- Gebauer Epitome -

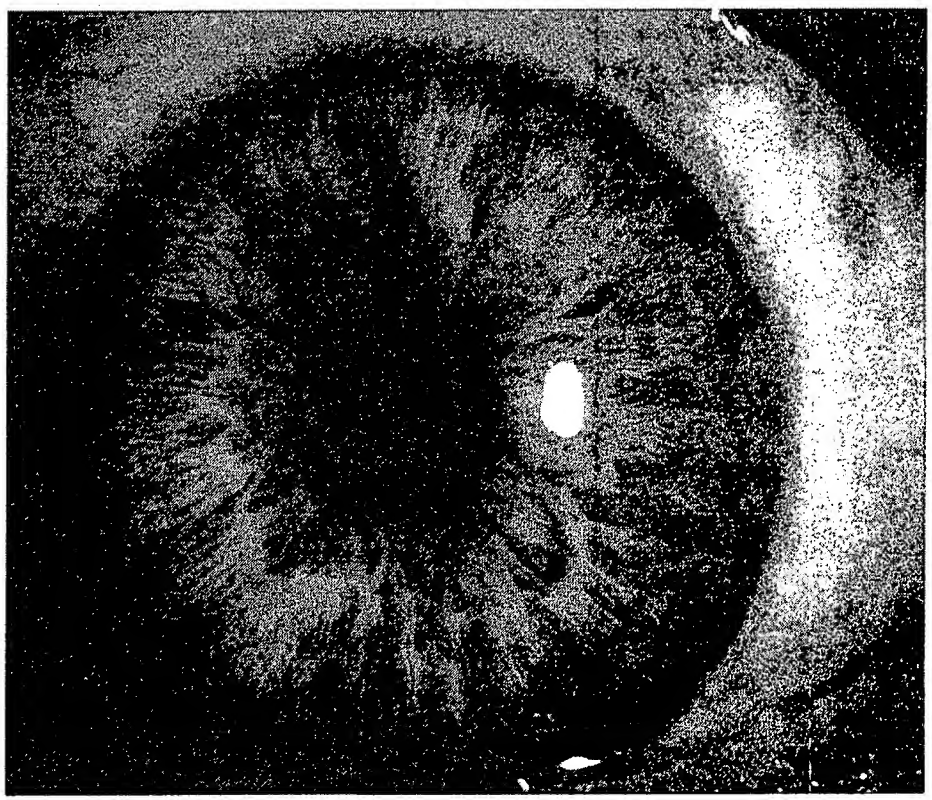


SAFETY: Change in BSCVA - Percentage

Epi-Lasik / LASEK without alcohol - Gebauer Epi-Tome - Chris P. Lohmann



- 1 day postop
- no contact lens anymore
- VA: 20/15



- 2 days postop
- VA: 20/20 +

Conclusions

- Effective
- Reproducible => consistent epi-flap
- Safe
- Future studies
- Larger experience

Surgical technique - Pearls

Recommended by Dr. C.P. Lohmann

- After laser treatment:
  - Wash wound bed thoroughly with BSS
  - Completely dry around wound bed especially hinge area
  - Replace EPI flap
  - Dry surface of flap and surrounding tissue before applying BCL
  - Using swab, press gently on surface of BCL to ensure all excess fluid is expressed from under the lens

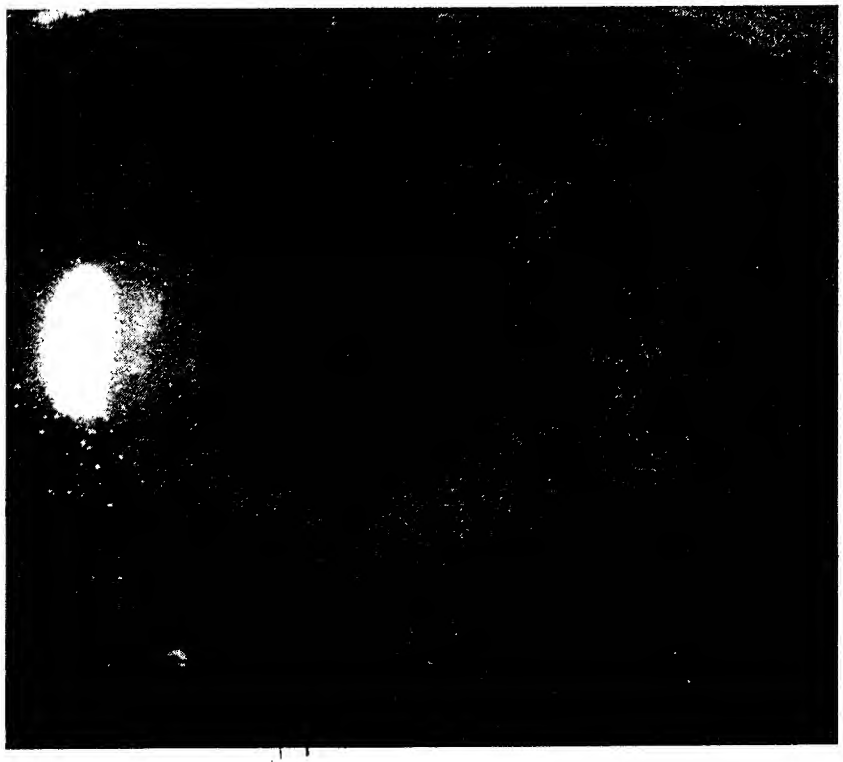
MEDICATION / TREATMENT (PRE, INTRA & POST-OP)

- **Pre-op (before entering OR**
  - ??
- **Pre-op (on table)**
  - Two (2) drops mepivacaine (or equivalent) to operative eye with 2 minute interval between both
  - NEVER use Tetracaine - can loosen epithelium
- **Post-op** (Same regimen as used for LASEK)
  - Provide patient with
    - small amount Voltaren for pain or discomfort during first 24 hrs
    - Non-preservative topical antibiotic (Kombistulln)
    - Non-preservative topical steroid drops (dexamethasone) 4x/day for 2 weeks and then 2x/day for further 2 weeks
    - Non-preservative artificial tears (carbomer) 4x/day for 4 weeks

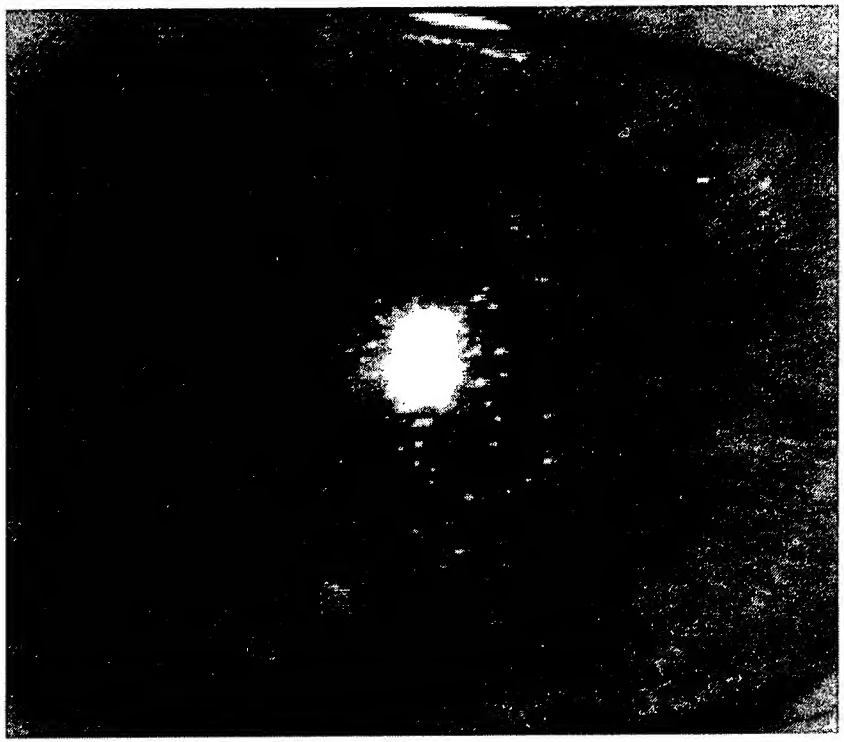
POST-OP CARE

- **15 - 30 mins post-op**
  - Observe at slit lamp that BCL is properly positioned and that the epithelial sheet is stationery and has not moved
- **BCL**
  - Currently Biometric 55 with BC of 8.9 is recommended

1 day post op Epi-LASIK
Gebauer Epitome



Biomedics 55 contact lens
BC 8.9
VA 20/20 uncorrected



B&L PureVsion contact lens
BC 8.6
VA 20/40 uncorrected

Post-op Examination

Day one

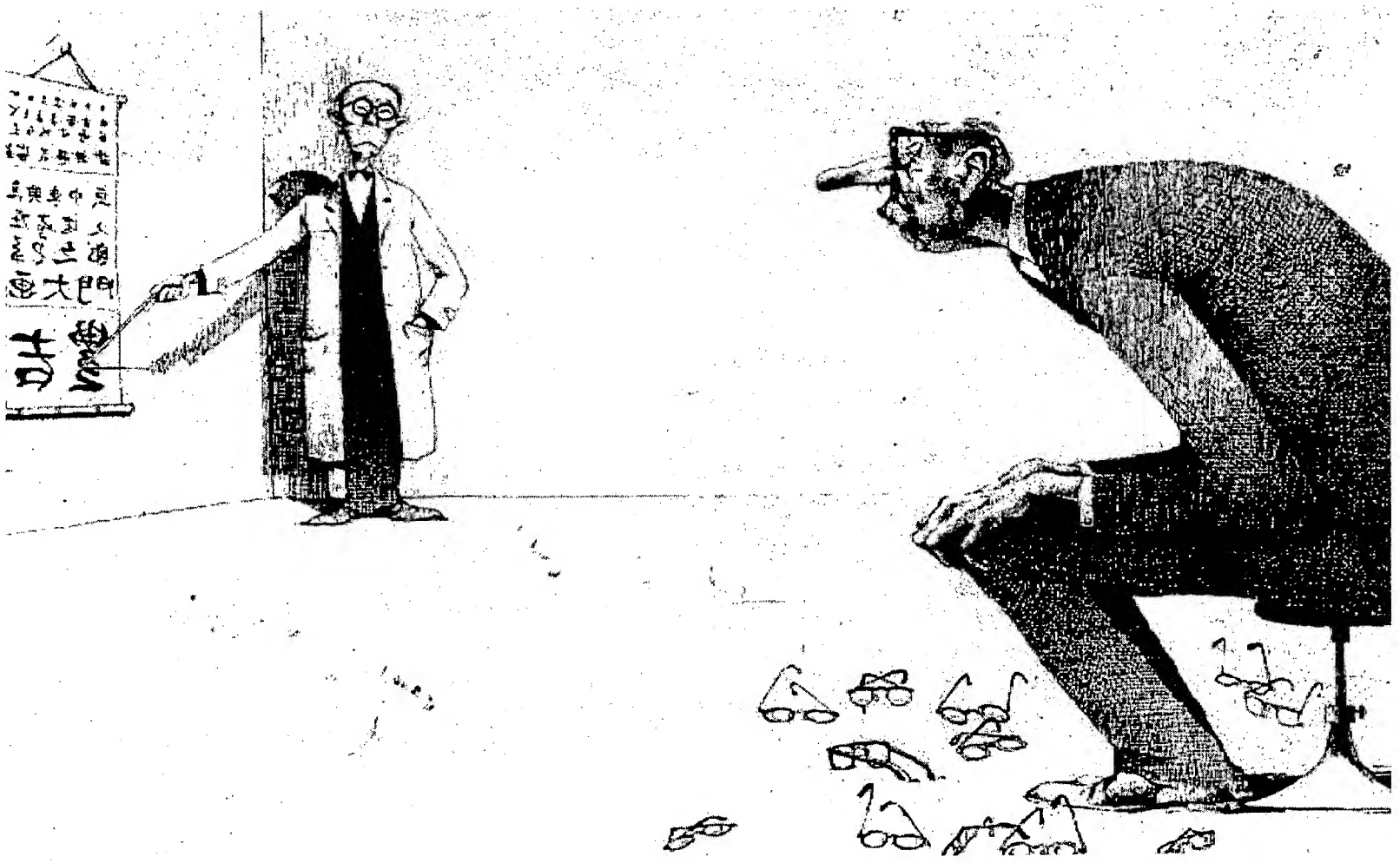
- At slit lamp, look for oedema
- Apply topical anaesthetic drops
- Check stability of BCL by using a swab to try to gently move the BCL
- If no movement, remove BCL by holding at temporal edge and lifting in temporal direction (ie: away from the hinge)
- If unsure, leave for one more day

INTRA & POST-OP COMPLICATIONS

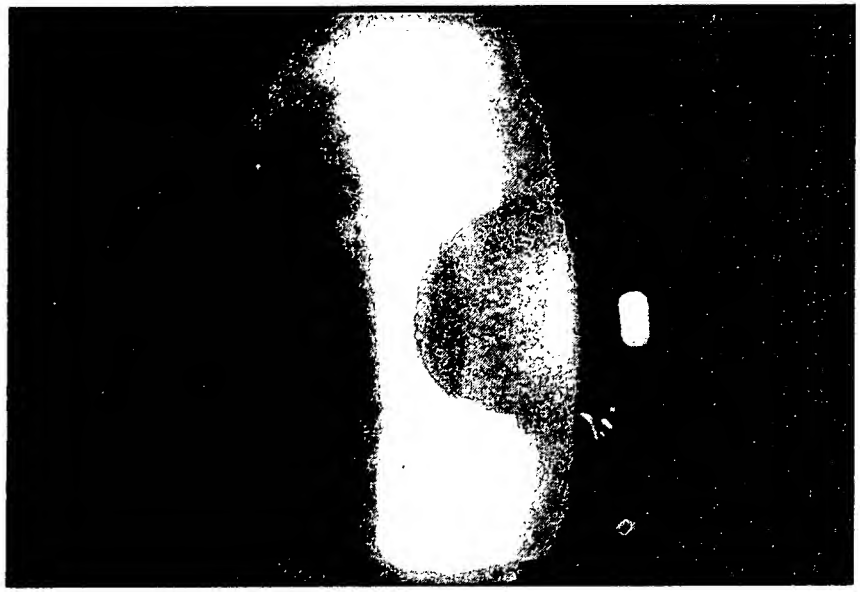
- **Inability to get suction even when unit shows vacuum attained**
  - If vacuum ring still mobile after max vacuum, check for trapped conjunctiva in aspiration hole on the ring
  - Try one more time only - if still a problem, change to 20mm ring ("high" vac ring)
- **"Incomplete flap"**
  - Often caused by deformed metal band (mishandling during assembly/disassembly)
  - Loss of suction during cut/dissection, usually due to incorrect angle of handpiece - too much upward or downward pressure exerted by user)
- **Conjunctiva "too allergic" (chemosis)**
  - Reschedule case and change medication
- **"Cant fit the vacuum ring"**
  - Check for "lid squeeze"
  - Use recommended speculum

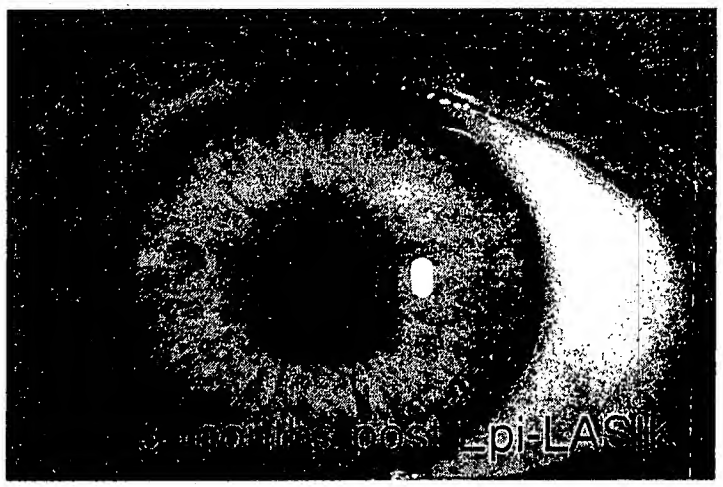
important:

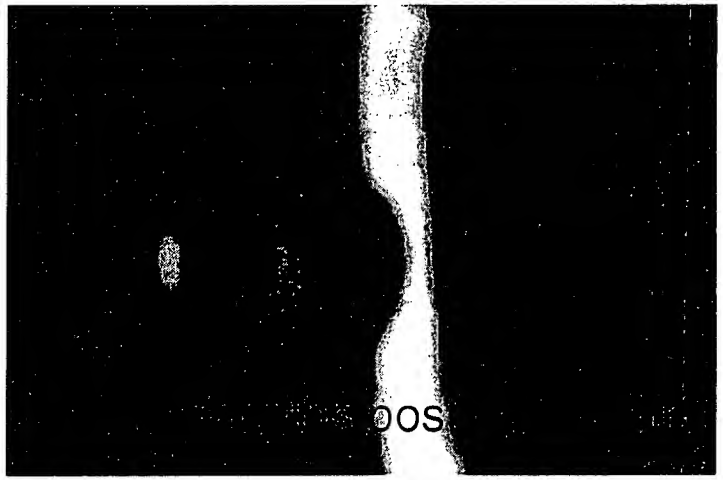
- perfect repositioning of the epithelium
- no fluid underneath BCL
- bandage contact lens
- carbormer artificial tears



10 min post op:	20/40 or better
day 1:	20/30 (20/40 to 20/10)
day 3:	20/40 (20/50 to 20/10)
day 6:	20/20 (20/30 to 20/10)

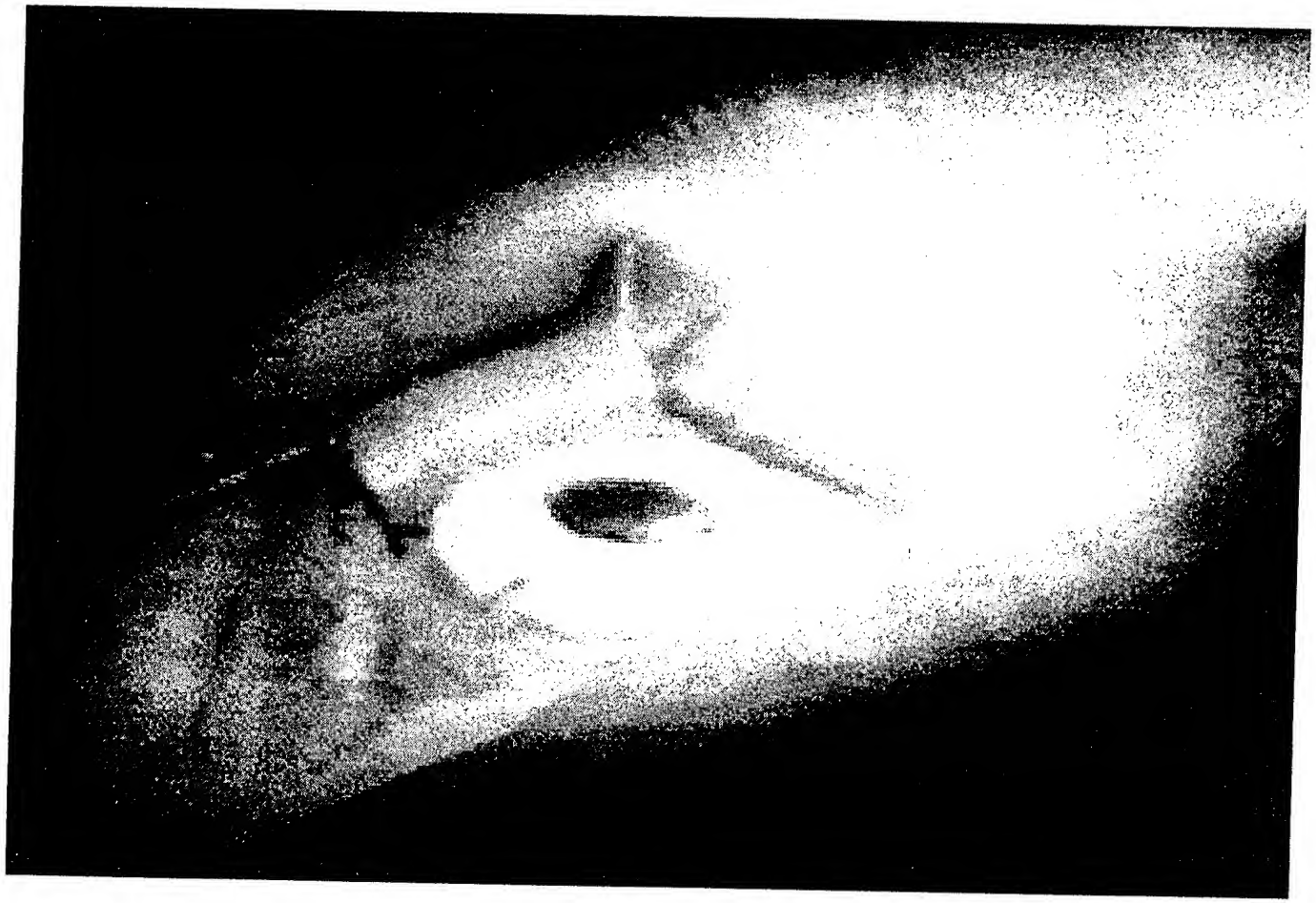


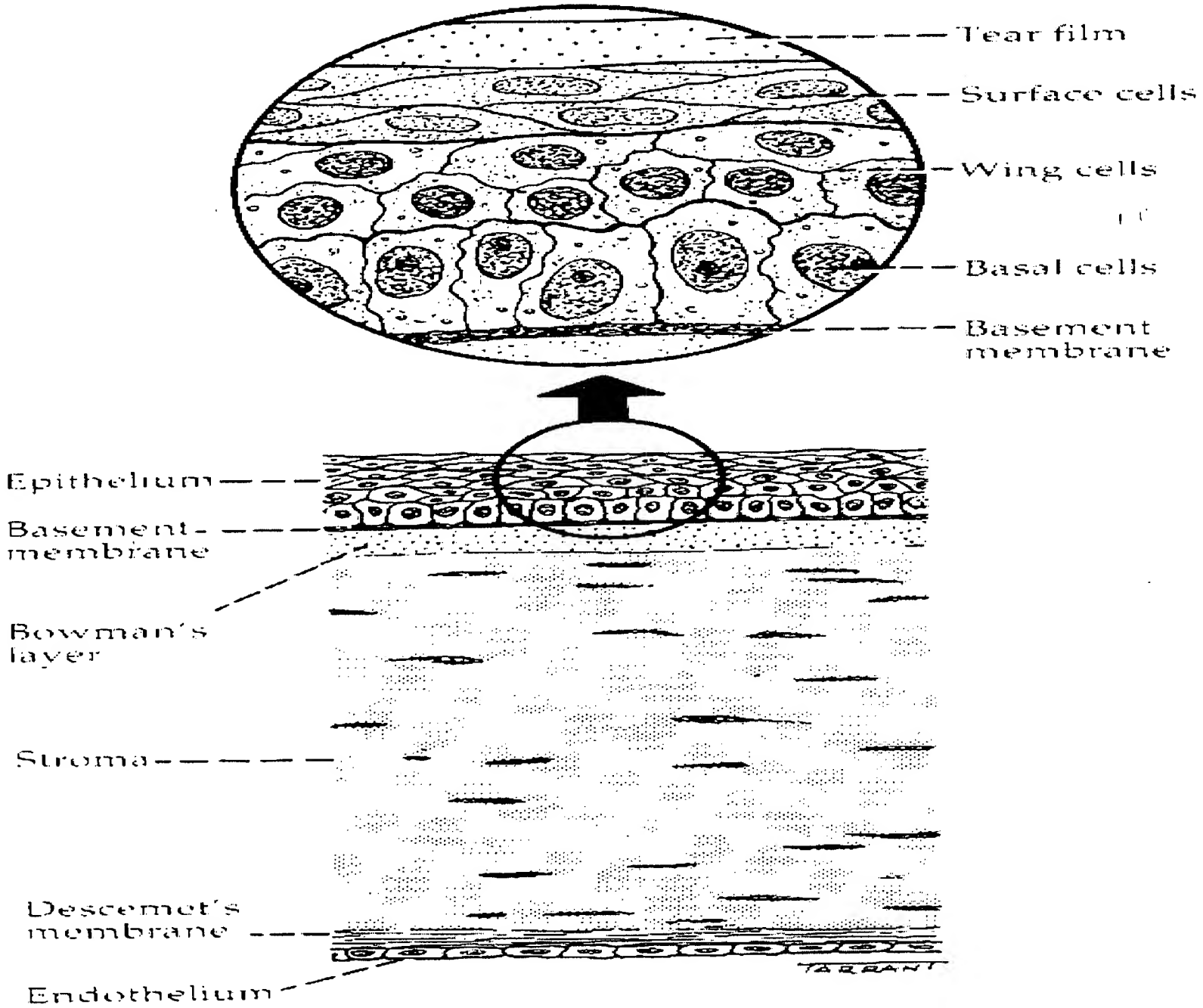




- ablation depth < 100 µm
- mitomycin C

Intraoperative corneal cooling with chilled BSS




Tear film
Surface cells
Wing cells
Basal cells
Basement membrane
Epithelium
Basement membrane
Bowman's layer
Stroma
Descemet's membrane
Endothelium
TARRANT